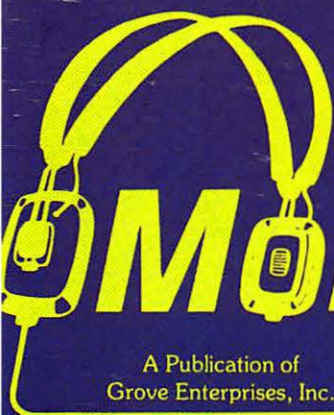


Volume 11, Number 8 • August 1992

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A Publication of
Grove Enterprises, Inc.

Monitoring Times

Data-tone squelch for
your scanner, more
news and reviews from
the full-spectrum
radio magazine.

Getting the FAX on the Weather

Pictures from your
shortwave receiver

Ringside at the Runway

Listening to your
local airport

Radio in Free Estonia

Vive la Difference
New or unusual targets
on shortwave



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Monitoring Times

Radio in Free Estonia

8

By George Wood

This northernmost of the Baltic Republics began an innovative broadcasting service during its brief period of independence in the 1920s. But since then, the airwaves have been used as an instrument of propaganda by one invader after another.

Estonia's proximity to Finland has given it greater access to the outside world and fostered its independent spirit. When political freedom finally arrived, broadcasting freedom had already been well established.



Ringside at the Runway

14

By Marilyn Mayer

Nothing quite equals the thrill of listening to air/ground communications while the boom of the engines rumbles against your chest. If your aero monitoring has begun to seem dry and unexciting, you haven't yet tried bringing your radio to the airport!

Showdown in Caracas

17

By Martin Delfin

Wakened by a phone call at 1:30 am, Radio Nacional de Venezuela staffer Marty Delfin was informed that an attempted coup was in progress. Delfin's account confirms the political verity that you can't control the people if you don't control the media.



The FAX on the Weather

20

By Bob LaPree

Until now, receiving weather facsimile pictures has been the passion of a rather elite group of hobbyists due to its expense and technical sophistication. No longer. Weather pictures and charts are now easily accessible by anyone with equipment and software that is readily available and reasonably priced.

Vive la Difference

By Charles Sorrell

24

Tired of the same old listening routine? Try changing the challenge to logging the oddities: hidden countries, legalized clandestines, broadcasts that don't fit the usual mold. Here are a few targets for starters.

When it Rains in Southern California

By Steven Dooner

27

"They say it never rains in Southern California..." and for six years it didn't. Then came the floods. Steve Dooner got caught in his own flood when it became clear the media could not monitor communications in his county.

And More ...

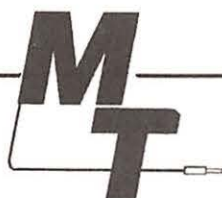
You'll find reviews this month on several popular items: Bob Grove looks at the new Realistic PRO-43 handheld scanner; Magne puts the British-made Lowe HF-150 through its paces; Ike Kerschner tests the elite Cushman R7 vertical antenna; and Clem Small gives VHF/UHF listening a boost with the MAX System Telescopic Ground Plane.

If you've always wondered what on earth "utilities" are all about but were afraid to ask, tune in to Utility World this month for a basic overview. Are you a little nervous about installing a mobile scanner in your car? Scanning Report will walk you through it. Beginner's Corner explains which pieces of test equipment can not only look impressive on your bench but may also turn out to be indispensable.

On a more technical level, Bill Cheek has devised a modification that PRO-2004/5/6 owners will find invaluable—a data tone squelch. Never again will you have to be irritated by the scanner locking up on data channels, nor will you have to manually lock-out frequencies that may change several times daily!

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LETTERS

Acknowledgements

With a ripple of the ether, a full year has passed since I became managing editor of *Monitoring Times*. It presents an opportune moment for a few words of gratitude. The first, and most important, is to our readers. Much of what makes *Monitoring Times* a dynamic, evolving hobby magazine is directly attributable to your input. Over the past year, the flow of letters, clippings and loggings has never flagged.

Your newspaper clippings (along with your own editorial opinions) are invaluable and we look forward to your future submissions. Do be sure the name of the newspaper appears somewhere on the clipping so we can give proper credit. Many of you kindly send us clippings in which Grove Enterprises or *Monitoring Times* are mentioned. Even though we don't print these items, I want you to know we do appreciate them for our files. It's nice to know what the media says about us, or to see a press release bear fruit.

One person I'd especially like to single out for her outstanding work is Robin Miller. Robin has designed our covers for a little over two years now, and I think you'll agree that those of the past few months have been particularly spectacular. Those readers and authors who provide the excellent vertical format photography for the covers also deserve a hand. Do you think you have a winning photo? It might be just what we are looking for!

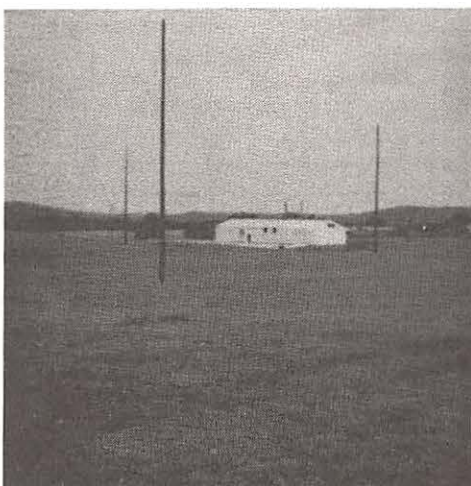
Two items of importance before I go on to your letters: For you aficionados whose military aircraft monitoring has suffered as big a shake-up as a California earthquake, be sure to watch for your September issue. Larry Van Horn will have the full scoop on the new Global HF System.

Secondly, everyone has been waiting for an update on the Senate's version of the FCC Funding Bill. So far, the Senate committee charged with writing the bill has shown no inclination to include the restrictive cellular clause. After twice being delayed, the markup session for the committee is now scheduled for early August, when the final wording of the bill should be determined. If the FCC Funding Bill passes the Senate without the clause which is contained in the House version, the two houses will have to reconcile the versions, hopefully by its omission!



Short Stops on Shortwave

R.C. Watts of Louisville visited new shortwave out-



let WJCR recently and enclosed a couple of Polaroids for us. He described the surroundings as "beautiful farmland with wooded hills in the distance. The stations are on a 256-acre farm with the 90.1 MHz FM tower (which runs 100,000 watts) atop the ridge to the south."

"The shortwave station is first on the gravel access road with the curtain rhombic antenna strung on utility poles circling the large open field. The building housing FM studios, office, phone bank and auditorium is back about an eighth of a mile past the semi-trailer billboard. WJCR hosts gospel music concerts, but has outgrown the auditorium. A large tent is currently being utilized for these concerts.

"Inside, we purchased some T-shirts, caps and buttons, and scrounged some stickers for ourselves and friends. This is a very friendly station and open to visitors during working days; Monday through Friday, 9 am to 4 pm."

RC says the station is nine miles outside Upton, Kentucky, on KY224 west toward Millerstown.

Whose is the voice giving the time announcements on WWVH and WWV? Peter Stawicki of Norman, Oklahoma, says this question has bothered him since he first began to listen to shortwave.

"Recently I sent a reception report to WWVH, Kauai, Hawaii," he says. In addition to receiving a colorful QSL, he received one of his answers: "Jane Barbe is the lady who so graciously lends her voice to WWVH's time announcement. Though I also sent the question and a reception report to WWV, Fort Collins, Colorado, I received nothing but a standard QSL."

Peter, Wayne Heinen, who is preparing a feature profile of WWV, has reported to us that WWV is severely understaffed, and that's probably why you received no answer to your question. But I'll bet one of our readers knows the answer to this trivia question!

SCORPIO

Model: SC-100 (PORTABLE RADIO) Location: England
 Date: 02-27-91 Page: Pg. 031735 End Pg: 17,336.00
 Mode: PLE Signal: 17,336.00
 Remarks: (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100) (101) (102) (103) (104) (105) (106) (107) (108) (109) (110) (111) (112) (113) (114) (115) (116) (117) (118) (119) (120) (121) (122) (123) (124) (125) (126) (127) (128) (129) (130) (131) (132) (133) (134) (135) (136) (137) (138) (139) (140) (141) (142) (143) (144) (145) (146) (147) (148) (149) (150) (151) (152) (153) (154) (155) (156) (157) (158) (159) (160) (161) (162) (163) (164) (165) (166) (167) (168) (169) (170) (171) (172) (173) (174) (175) (176) (177) (178) (179) (180) (181) (182) (183) 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LETTERS

If you've tuned in WRNO, New Orleans, lately, you may have heard a new spot called National Vanguard Radio. Charlie Diamond of Toronto, Canada, is one reader who did and was motivated to write the station. Here is his letter to station manager Joseph Costello:

"I was shocked to hear WRNO broadcasting National Vanguard Radio/American Dissident Voices programming on Sundays 0100-0130 UTC on 7355 kHz. In spite of your station's equivocal disclaimer that it 'does not necessarily reflect' the views of management and staff, the fact that your station allows itself to be used to disseminate racist, xenophobic, anti-semitic propaganda, and (in the broadcast of June 6th) advocacy of lynching, is clearly irresponsible and not in the public interest.

"While First Amendment rights include free speech, they do not include a license to use the public airways. That is a privilege granted to licensees who demonstrate they are worthy of a public trust, granted by government.

"How has WRNO demonstrated it is worthy of that trust?"

Now that we have your attention, turn to "Outer Limits" for some speculation on who is behind Vanguard Radio.

While on the subject of free speech, Dennis Paulson wrote this response to the recent discussions on religious broadcasters:

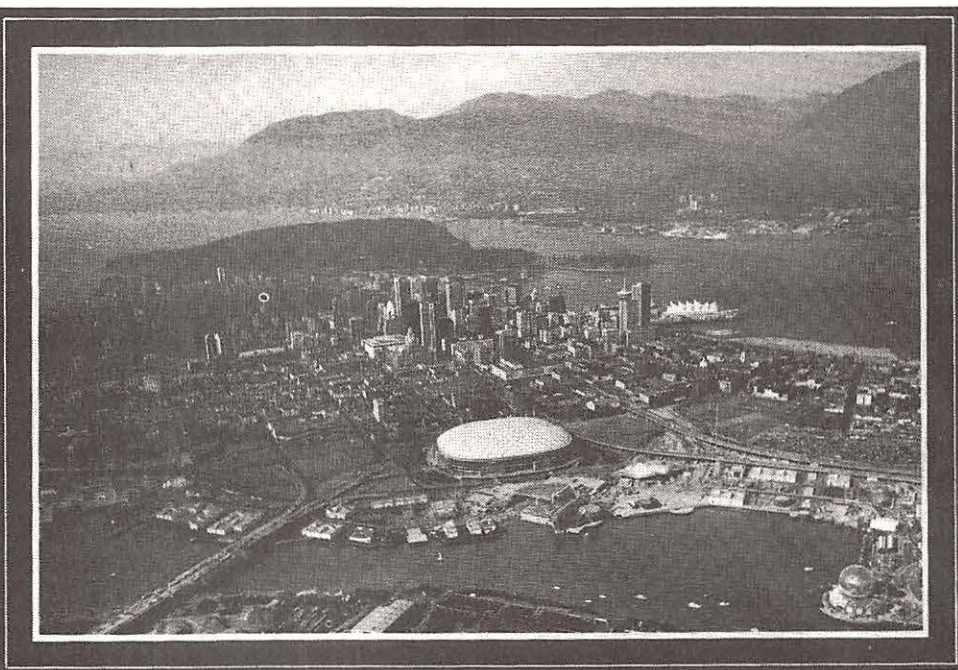
"After reading your June editorial on religious broadcasters and other related articles, I have come to the conclusion you would like to see them censored. The problem is you or I will not be the ones to decide, it will be some politician. If we let them censor fanatical religious broadcasters, where will they stop? Their next target will be scanners and who knows what else. Let's fight censorship of any kind so we can have free use of the airwaves."

Harold Bower of Sunbury, Pennsylvania, has a novel test for determining who should remain on the air: "In my opinion, the test should be proof of results. If you advertised a radio for \$25 that would get AM, FM, SW, day and night from all over the world you would soon find yourself in a lot of hot water. So, if the quacks want to stay on the air, let them prove that, by means of their broadcast, someone has met Salvation."

Oh brother; I can hear those worms crawling out of the can already!

Taking Aim at the Archer

Few letters have drawn so much interest as James Tunnell's endorsement of the Archer Amplified TV antenna used with a hand-held scanner, and Reijo Siivonen of Rauma, Finland's



calling the use of an amplified antenna "a questionable practice."

Club bulletins have been filled with reports of hobbyists who have put James' idea into practice. Bob Grove himself reviews the Archer antenna in this issue.

But Frederick Dodge of Albany, New York, says all this technical analysis isn't necessary; you don't have to know how to design a generator in order to use electric current. The question is simple: Does it work or not? He says, "I bought the unit and it works extremely well. I was able, with the 'boost' switch on, to hear an unidentified aircraft advise his terminal that he was 'in the Hartford area' enroute to Indianapolis. Hartford, Connecticut, is over 100 miles from Albany. Switching between a telescoping antenna and the Archer unit proved the Archer unit greatly extended the reception distance of my PRO 34."

Brad Thiele of Sandy, Utah, says, "After reading James' comments on the Archer Amplified antenna, I went out and bought one. And you know what, it works very well, thank you. There are no internal disturbances Reijo was so insistent it would cause. In fact, it cut down a lot of background noise on my PRO-2006, BC760XLT and Regency 4020. At the same time pulling in weak signals that the stock antenna and a Radio Shack centerloaded after market antenna will not pick up at all. Perhaps Reijo should write something 'meaningful in content, not just descriptions and opinions.'"

David Rogers also felt that "Reijo Siivonen's comments ... should not go unanswered. I bought one and tried it with several scanners, including my Regency 4030 (BC200XLT twin), Radio Shack PRO2006, and Yaesu FRG9600.

"In all cases, I have found it to be extremely useful where an outside antenna was not avail-

able. For cordless phone monitoring, it can raise a noise level signal to full copy. The higher in frequency it goes, the less amplification value it has, but being able to move the antenna around, adjust the dipole, even put it in a vertical stance, all help in pulling in signals that are otherwise difficult, if not impossible, to copy. There are times when it is useful even with the amplifier turned off.

"All in all, given the price, I think that it is a very useful device. I carry mine—together with a couple of clothes pins for hanging it from curtains in motels whenever I travel."

While Bob Grove's conclusions are more reserved, neither did his review note the strong signal overload often produced in a receiver by an active antenna. Radio Shack should be experiencing a lively trade on its catalog item 15-1607!

More Antennas

Eric Walton of Vancouver, who provided a sketch of a homebrew wire antenna in the June issue, answered my question as to how it compared with the McKay-Dymek DA100D antenna he had recently purchased.

"As to be expected the Dymek DA100D certainly made a difference in reception, especially the weaker signals. However, I moved the short wire antenna out on the balcony, and there are times when it will equal the Dymek. For example, when listening the Radio Korea (Seoul) at 1215-1315 UTC on 9750, the VOA on 9740 and BBC on 9740 usually interfere using the Dymek. Switching to the wire antenna reduces the signal strength, but also eliminates reception of the interfering stations.

Continued on page 111



Coming Soon!

October 2-4

The 1992 Monitoring Times Convention!

Omni Hotel CNN Center
ATLANTA, GEORGIA

GREAT Seminars:

Friday, October 2:

Radio Law
Trunk Busting Basics
Who's Who on the Spectrum
Beginner's Aero Monitoring
Pirate DXing
A Professional Monitoring Post
Choosing an SW Receiver
Beginner's QSLing

Saturday, October 3:

Surveillance
Digital Communication Services
Aero Monitoring
Beginner's Q&A
TVRO: The State of the Art
Setting Up Your Scanner Listening Post
Monitoring Federal Communications
Beginner's on the Frequency Spectrum
When to Accessorize
The International Broadcasters
Beginner's Scanning
Receiving Antennas: Will a Wire Work?
Trunk Busting Basics
SW Domestic News Monitoring
Beginner's Utilities
Digital Communication Equipment
Aero Monitoring
Beginner's Computers

Sunday, October 4:

Military Monitoring
Radio Law
Mystery & Intrigue
Beginner's Antennas
Scanner Experts Forum
SW Experts Forum

GREAT Companies on exhibit:

AIE Corp.
All Ohio Scanner Club
Austin Antenna
Auto Security & Access.
Bearcat Radio Club
Cellular Security Group
Christian Science Monitor
R.L. Drake
DX Computing
Grove Enterprises
Ham Radio Business Council
ICOM

J & J Enterprises
Japan Radio Company
Lowe Electronics
Official Scanner Guide
Optoelectronics
Passport to World Band Radio
Radio for Peace International
Shortwave Paradise
Somerset Electronics
Universal Radio
V-Communications
Worldcom Technology

Come join in on the fun! Here are some of the spectacular events that will be going on throughout the weekend:

● **Saturday Night Banquet.** A festive feast with friends and family! Includes an all-you-can-eat buffet of tender meats, fresh vegetables, delicate fruits, refreshing drinks and towering desserts, highlighted by a special guest speaker!

● **Hidden Transmitter Hunt.** Ready your receivers and freshen your frequency counters, because this year, we've got a REAL challenge planned! Object of the game is to chase down the person, place or maybe even plant that has the hidden transmitter. Fun and prizes abound during this highly popular event.

● **Sunday Swap Meet.** A friendly gathering of our guests who set up their own displays and swap, buy and sell all the gadgets they want! Always filled with great bargains and hopeful people, the swap meet is a fun place to be.

● **FREE Tour of CNN Studios!**

Registration is \$40; banquet fee is \$21.95. Call 1-800-438-8155 and charge it to MC/VISA/DISCOVER or write MT Convention, P.O. Box 98, Brasstown, NC 28902-0098.

CALL TODAY! Come join the fun at the 1992 Monitoring Times Convention in Atlanta, Georgia on October 2, 3, and 4. Transportation to Atlanta is available by plane, train or bus! Don't miss the hottest new convention in decades.



Radio USA Busted

The Laurel, Maryland, Field Office of the Federal Communications Commission announced that it has closed down Radio USA, a veteran shortwave pirate station that has been on the air since 1983. FCC personnel visited the station on February 23 in Springs, Pennsylvania. In June the FCC issued a \$17,500 Notice of Apparent Liability to the alleged operator of the station, Andrew Yoder of Chambersburg, Pennsylvania. This is by far the largest fine ever issued to a North American pirate radio station.

The FCC says that it traced Mr. Blue Sky's Radio USA broadcasts on 7415 and 7416 kHz to transmitter locations in several eastern and midwestern states. The station was issued a base fine of \$8,000 for unlicensed broadcasting, \$2,000 for "intentional" repeated operation, and an additional \$7,500 for failure to permit a station inspection by FCC personnel.

Yoder, a well-known author and a prominent figure in the DX hobby, disputes the FCC charges and denies responsibility for the unlicensed broadcasts. *MT* will have additional coverage of this significant case in next month's "Outer Limits."

Pirate Accused of Aiding Riots

Mbanna Kantako's six year old "Black Liberation Radio" has once again come under the spotlight as authorities begin discussing its role during the Rodney King riots at the John Hay Holmes Housing Project in Springfield, Illinois. During the rioting, Springfield Housing Authority administration buildings and vehicles were set ablaze, rocks and bottles were hurled at police and firefighters, and nearby businesses were looted. According to

police, Kantako broadcast the position of police officers during the rioting.

"He was fueling the fire," said George Murphy, Springfield police department deputy chief of operations.

"We were doing what was necessary to protect our people," said Kantako.

When contacted by a local newspaper, the Federal Communications Commission indicated that the station had been off the air. FCC Engineer Will Grey was quoted as saying that "We inspected his radio station a couple years back and we shut it down." Kantako was fined \$750 but never paid.

"We have about 700 collection cases involving millions of dollars," said assistant U.S. attorney Jim Lewis. "We then have to figure out where is a good use of our time and energy in collections. Our best assessment is that this will be hard to collect."

"Black Liberation Radio" continues to operate between 107.1 and 107.5 MHz.

Freebander Roundup

The FCC has issued Notices of Apparent Liability for Monetary Forfeiture to 54 radio operators. The individuals, commonly known as "freebanders," engage in citizen's band activity just outside the CB band. Forfeitures ranged in amount from \$250 to \$3,500 depending on the nature of the violation, financial impact, whether they are repeat offenders, and "other factors." The 54 come from all areas of the United States.

One-Way CB OK

The FCC has amended its Part 95 Citizens Band Radio Service Rules to clarify that CB stations operated by local government entities may make one-way transmissions concerning highway conditions to assist travelers. The action was taken in response to a request by the Federal Highway Administration who had asked to develop and transmit scheduled bridge openings over CB transmitters.

Pranksters in Texas

It's the middle of the night in east Dallas. Suddenly, fire station sirens begin to wail. Neighbors, alarmed, turn on their scanners to find out what's going on. All that is on the air is routine traffic. The next weekend rolls around and once again, the ghost sirens are triggered. Frustrated, city officials call on the FCC to find out what's going on.

The problem, they are told, is that someone using a mobile radio transmitter is triggering the sirens illegally. Each blast lasts between four

and five minutes. Multiple fire stations have been affected.

The Fort Worth *Star-Telegram* says that the FCC has not, as of press time, decided whether to investigate. Meanwhile, city officials and Dallas residents are powerless to stop the blaring sirens in the middle of the night.

Cable TV Comes to Beijing

Bad TV is coming to the People's Republic of China. Can democracy be far behind? According to the Xinhua News Agency, the Beijing Cable TV Company has begun trial operations. They expect to open three channels this year and seven next year. The film and television series channel will offer "Good Morning, Beijing," "Divorce Contract," "Roots," "Li Lianying," and other programs produced by the mainland, Hong Kong, Britain and the United States.

Bright Idea?

The latest buzz in the broadcasting business is coming from light bulbs! Intersource Technologies is developing a long-life (up to 14 years) light bulb which utilizes radio waves. Needless to say, the announcement of its imminent manufacture in 1993 has raised a high level of concern among hobbyists and even the National Association of Broadcasters.

The E-lamp, as it is called, converts household energy to the radio frequency 13.560 MHz. The RF energy is used to cause phosphors to glow, similar to a television picture tube.

Will this light bulb be another addition to the growing list of interference sources from modern conveniences? Bob Grove examines the facts and the rumors next month. Watch for his report in "What's New?"

Top-40 Tummy Radio

David Sheley has forwarded a clipping from an unidentified magazine that claims that a four month-old baby swallowed a miniature transistor radio and now plays music from his stomach. The article identifies Timmy Connors of San Francisco, California, as the musical baby who swallowed the quarter-size radio.

"It's kind of weird," says Timmy's mom. "Timmy's got Madonna and Michael Bolton songs coming out of his stomach."

Doctors are supposedly going to operate to remove the radio but for now, everybody

COMMUNICATIONS

seems to be enjoying the novelty. Believe it...or not.

800 MHz Buzzing

United Parcel Service says that it's going to use mobile phone technology to allow it to track packages from pickup to delivery. By early 1993, 50,000 UPS delivery trucks will carry cellular equipment to transmit package tracking information through the company's new telecommunications network, according to the Birmingham *Post-Herald*.

An Avoidable Tragedy

A 21 year old Grand Prairie, Texas, man was electrocuted when a radio antenna he was helping to position came in contact with a 7,200-volt power line. Steven R. Harthcock and two friends were on the ground, attempting to "either put up or take down" an antenna when it brushed the power line, said Fire Investigator Lt. Doug Conner. "They gave him CPR for 20 or 25 minutes and they defibrillated him several times," said fire Marshall James Smith.

According to the *Grand Prairie News*, Harthcock was taken to Dallas/Ft. Worth Medical Center-Grand Prairie, where he was declared dead about a half hour later. His two friends on the ground were also injured. A fourth man, working on the roof when the accident occurred, was not injured because he was not grounded, said Conner.

50 Years of Service

The Armed Forces Radio and Television Service has celebrated its 50th anniversary with a Peabody Award. According to Air Force Col. Rick Fuller, commander of AFRTS' Los Angeles broadcast center, congratulations have poured in from movie studios, TV networks and, especially, U.S. soldiers, sailors and marines stationed overseas. "We're second only to mail from home as a morale factor for them," said Fuller.

Interestingly, AFRTS roots go back to pirate radio when, in 1942, Army officials noted the popularity of pirate stations operating at bases in Kodiak and Sitka, Alaska. The official "go ahead" came that same year.

Before long, AFRTS took to the airwaves via shortwave, a practice dropped only within the last five years. AFRTS currently beams programs to more than 500 outlets in 128 countries, as well as 400 Navy ships at sea.

Poppele VOA Station

One of America's radio and television pioneers was memorialized recently when a Voice of America transmitter station in California was named in his honor. Jack Poppele worked as a salesman of crystal radio sets after World War I, put WOR on the air in 1922 and broadcast the nation's first Christmas program.

Poppele began broadcasting from the roof of Bamberger's Department store after selling the idea to company founder Louis Bamberger. The license cost Bamberger \$5.00. WOR was the nation's 14th radio station. Initially, says the Newark, New Jersey, *Star Ledger*, Poppele served as the station's engineer, played records, interviewed guests, and read commercials.

Poppele also launched WOR-TV, founded and served six terms as president of the Television Broadcasters Association, and was appointed director of the Voice of America by President Dwight Eisenhower. He died in 1986.

Coax, Shortwave Researcher Dies

A leading researcher and one of the developers of coaxial cable has died at the age of 95. Sixty years ago, Dr. Sergei A. Schelkunoff researched the coaxial cable now commonly used for television transmissions. Born in Samara, Russia, Dr. Schelkunoff was a University of Moscow student caught up in the tumult of World War I and the Bolshevik Revolution. Drafted as a Russian army officer, he fought his way across Siberia, into Manchuria and on to Japan before arriving in Seattle in 1921.

According to the *New York Times*, Dr. Schelkunoff also conducted extensive research on shortwave radio, broadband antennas and grounding. There were no immediate survivors.

Do you see an interesting item on radio in the news? Clip it out and send it in. "Communications" is compiled by Larry Miller from reader contributions. Credit and thanks this month go to: "Alton"; David R. Alpert, New York, New York; Henry Brown, East Falmouth, Massachusetts; Lloyd J. Leheney, Springfield, Illinois; Ricardo Molina; Doug Robertson, Oxnard, California; William Sellers, Capshaw, Alabama; David Sheley, Blytheville, Arkansas; Buell R. Snyder, Beachwood, New Jersey; George Speck, Ft. Worth, Texas; *W5YI Report*; George Zeller, Ohio, and "Signals"; Karl Zuk, New York.

NOW YOU'RE TALKING!

The Code-Free Ham License is Here

Enjoy all Amateur Radio privileges above 30 MHz without having to pass a code test. All you have to do is pass a 55-question exam on basic radio and the FCC regulations. ARRL's new book, *Now You're Talking* makes understanding what is required on the test a snap! And there are exams given all over the country every weekend.



Just think how much fun you'll have communicating through repeaters, enjoy Sporadic E skip and worldwide communications on six meters when conditions are right. There's satellite communication and you can even talk to Astronauts and Cosmonauts in orbit. Enjoy friendly local communication both direct and through repeaters. Help with disaster drills and the real thing! Sound like fun? It is! Order your copy of *Now You're Talking* below: Enclosed is \$19 plus \$4 for shipping (a total of \$23) or charge \$23 to my ☐ VISA ☐ Mastercard ☐ Discover ☐ American Express

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Radio in Free Estonia

By George Wood

Broadcasting freedom arrived in Estonia before the political freedom sought by these demonstrators.



With the disintegration of the Soviet Union, a host of new countries has appeared. The break-up has meant a radical change in broadcasting in the former Soviet republics. One of the first to break away was Estonia, which I visited at the end of 1991, taking the overnight ferry from Stockholm.

Estonia is the northernmost of the three Baltic republics, along with Latvia and Lithuania. It's had close historical links with both Sweden and Finland. After centuries of domination by powerful neighbors, the three republics enjoyed a brief period of independence between 1920 and 1940 at which time they were occupied by the Red Army and forced to join the Soviet Union.

Broadcasting arrived in Estonia during that brief spell of independent rule. The first broadcasts in the country began on May 11, 1924, from Haapsalu, a small town on the western coast. "Raadio Ringhaeaeling" (Radio Broadcasting)

was organized as a joint stock company in November that year, but the company's first transmitter went on the air two years later, December 18, 1926, in the capital, Tallinn.

A second transmitter began operations from Estonia's second largest town, the eastern university city of Tartu, in late 1928. Raadio Ringhaeaeling became the state-owned "Eesti Raadio" (Estonian Broadcasting Company) in 1934.

"We had the most powerful transmitter in all of Europe," Margus Hunt, Estonian Radio's Program Director, told me when I visited him in his office a few blocks from Tallinn's Old Town. "It was built in 1937 in a town called Tueri."

Those early broadcasts were on the air for 15 hours a day, mostly live. Estonian Radio even had its own orchestra. There were live broadcasts from Helsinki, joint programs with Finnish Radio, and in 1938, even experimental stereo broadcasts on mediumwave.

World War II and Soviet Annexation

All that changed when World War II started in 1939. Estonia was occupied first by the Soviet Union, then by Nazi Germany, and then by the Soviets again, who annexed all three Baltic states. Radio was run by the occupying powers. Following the German invasion in August 1941, the Red Army blew up the Tueri and Tallinn transmitters.

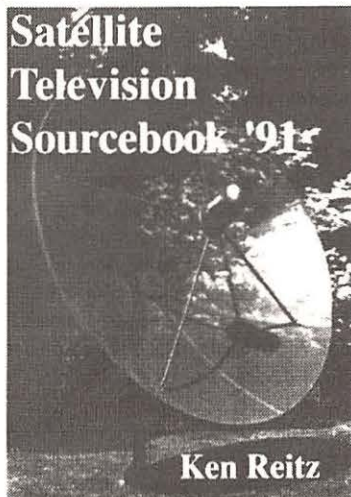
In September 1941, the Germans set up "Landessender Reval" (using the medieval German colonial name for Tallinn). The German Army also began the construction of a new studio building that's still used today. (The modern offices are in a newer structure next door.) The German station left the air in September 1944 when the Red Army once again occupied Estonia. Broadcasting resumed the following month, with Estonia firmly part of the USSR.

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"Most of our programs were aimed at influencing the Estonian people," Margus Hunt says of the post-war years, "Red propaganda telling them what to do, about collective farms, and so on."

After the pioneering work of the twenties, post-war broadcasting in Estonia lagged behind developments in the West. The first FM transmissions were in 1956, with stereo introduced in 1961. A second radio channel went on the air in 1967. There were even test broadcasts in quadraphonic sound in 1977, but it was 1986 before a third channel began operation.

Television arrived in Estonia in 1958. "In the beginning, they had more freedom than radio," says Margus Hunt. "But of course, television finally went the same direction as radio, and we were both under the control of the Communist Party."

Broadcasting freedom arrived in Estonia before political independence. In May 1988, the head of the Communist Party in Estonia was replaced by an Estonian who had been Soviet ambassador to Nicaragua. He removed the controls on journalists. Margus Hunt says it was chaotic at first:

"Maybe we had more freedom than journalists in the West because the old laws didn't work any more, but there were no new laws for journalists. It was a bit like a jungle."

During the summer and autumn of 1989, the Estonian Broadcasting Company underwent a radical restructuring, six months before the first steps towards political independence. International recognition of Estonia was achieved after the failed Soviet coup of August 1991.

Radio Today

Today, Estonian Radio operates four national networks, along with two local radio stations in Tallinn and the external service Radio Estonia. The first channel is primarily a "talk channel" with radio drama, readings from books, and talk shows, along with some classical and folk music. It operates on both mediumwave and FM, along with a shortwave relay.

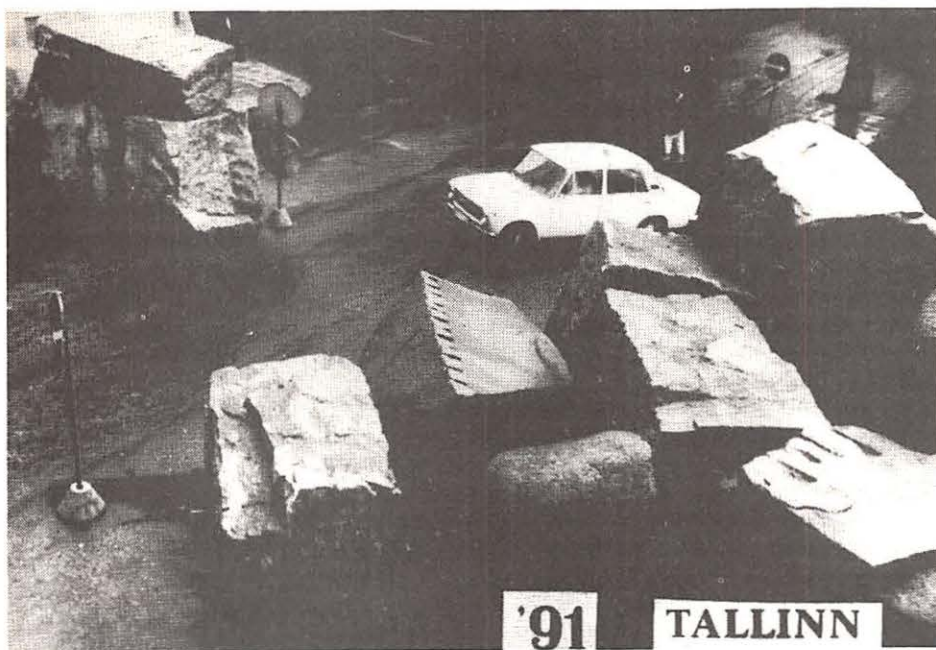
The second channel, "Vikerraadio," has a lighter format with pop and rock music, short news bulletins and sports. It's also carried on both mediumwave and FM, with the six FM transmitters also carrying local programs.

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A street barricade sought to restrict confrontations between Estonians and the Soviet black berets during the Soviet coup. It was Ehtel Halliste's second week as the English Service announcer.

The third channel is mainly devoted to music. FM only, it carries live concerts from the Estonian opera, as well as recorded classical music and some current affairs programs.

Channel 4 is the service for ethnic minorities. One of the most controversial political debates in Estonia concerns the country's Russian-speaking minority. During the five decades of Soviet rule, Russians were encouraged to move to the Baltic republics. Today, Russian-speakers make up nearly one third of the population of the country and fully half the population of the capital, Tallinn. Estonians are afraid of losing their identity to Russian "cultural imperialism," while foreign observers are concerned that the civil rights of ethnic minorities may be threatened by the wave of nationalism.

Essentially, Channel 4 is a Russian language channel, with Estonian Radio's own programs as well as relays from Boris Yeltsin's Russia's Radio. In November 1990, weekend programming in Ukrainian and Byelorussian were added. There are also programs in Yiddish and Armenian. Channel 4 broadcasts on both mediumwave and FM.

There are also two local radio stations serving Tallinn, one in Estonian and one in Russian. Both operate on the FM band only, and like the country's other FM stations, they use the Eastern European 69-75 MHz FM band. The Estonian language Radio Tallinn also broadcasts over the country's only transmitter using the Western 88-

108 MHz FM band. This transmitter, on 101.6 MHz, is also used to relay the external service Radio Estonia, and during the summer months carries a multi-lingual service for Western tourists.

Estonian external broadcasting dates back to 1940 when daily programs in English and German and weekly reviews in French and Swedish were introduced. Today there are daily programs in Finnish and Swedish, three days a week in Estonian, and twice a week in Esperanto. German broadcasts are due to begin later this year.

Radio Estonia began broadcasting in English in March 1989, with a weekly program called "Estonia Today." In October 1991, broadcasts in English were increased to twice a week. The head (and only staff member) of the English Service, Ehtel Halliste, told me that lack of English-speaking staff is the main reason the programming is limited. Estonia's current economic woes make other jobs more attractive.

"The salaries at radio are not that high," she says, "so people who speak good English work as interpreters or tour guides or other jobs that offer better salaries." (And access to Western currency!)

"We are heading towards broadcasts every day," she adds. "We want to broadcast in English every day. One plan is to start on the local Radio Tallinn channel with short programs every day for visitors, which could be heard in the hotels."

She is assisted by a number of native English-

speaking freelancers who make interviews and check the program copy to make sure the grammar is correct. Ehtel learned her English at an elite school in Tallinn and keeps up to date watching American programs on Finnish television. She's never been outside the European republics of the old USSR, let alone to an English-speaking country. Her English is excellent, though with a definite and pleasing accent.

On Mondays, Radio Estonia presents news of the previous week from Estonia and the Baltic states. The Thursday program covers everyday life and culture, including Estonian music.

For a small country, there's been a lot to report as Estonia has forced its way to freedom from Moscow. During the failed coup in August 1991, Lithuanian and Latvian Radio were taken over by Soviet troops. Independent stations in Russia were closed down. The coup came during Ehtel Halliste's second week on the job.

"I've never been so afraid in my life..." she says. "As the only station broadcasting freely in the Baltic states, we broadcast news three times a day in Estonian, Russian, Finnish, English and Swedish."

The small shortwave transmitter on 5925 kHz doesn't put out much of a signal and there are few regular listeners to Radio Estonia outside of Scandinavia and Western Europe. Many shortwave listeners in Sweden tune in, but reports from farther away are rarer and usually come from dedicated DXers. The farthest away have been in Australia, Brazil, Peru, Japan and the Philippines.

The Outside World Broadcasts to Estonia

The world outside first began broadcasting into Estonia during the occupations of World War II. Both sides aimed programs at Estonia, the Soviet Union using transmitters in Leningrad.

Unlike many other parts of the Soviet Union, Estonians were able to easily tune in to broadcasts from abroad. Helsinki is less than 100 kilometers/65 miles away across the Gulf of Finland, and people in Tallinn and the northern Estonian coast have been able to listen to Finnish radio and watch Finnish television. Mediumwave reception has been easy. The different standards used for both FM and television have been overcome as well. According to Margus Hunt, there's a shortage of FM radios in the shops. Consequently, many Estonians have bought FM radios on visits to Finland (Helsinki is just a four hour ferry journey away). Those radios have the Western 88-108 MHz FM band.

"I would say that fifty percent of the radios in Tallinn have the Western FM dial," he says. "That's why we began broadcasts on the Western FM band."

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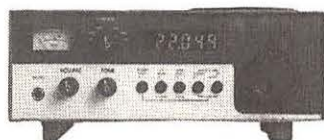
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Television sets, which come from the factory using the Soviet/French SECAM system, are routinely modified in local shops to also receive the Western European PAL system. Tallinn residents can easily watch three channels from Finland. For many years those three signals have been most Estonians' only window to the West. One woman I met was an avid viewer and was familiar with dozens of Western programs. Her favorites were "Dallas," "Dynasty" and "Falcon Crest," and I had to wonder how accurate a reflection of the West appears through those three tenuous TV windows.

In the early 80's, a new Communist Party boss from Moscow tried to stop Estonians from viewing Finnish television, ordering that the TV antennas aimed across the Gulf of Finland be removed overnight.

"But of course it didn't work," says Margus Hunt. "Maybe they cleaned up ten or fifteen roofs, but then the antennas came back."

Estonia...

anxious for contact with the outside world.

The satellite age, however, has greatly opened access to Western broadcasters. My hotel had a dish on the roof for the Astra satellite, and carried Sky News, MTV and a German channel on its internal TV system, along with the single Estonian channel, three Soviet channels and three from Finland.

Satellite viewing is not very popular in Tallinn, where Finnish channels are available over the air anyway. But satellite dishes are much more common in other parts of the country, especially in the university city of Tartu.

For those Estonians outside the reach of Finnish television and unable to afford satellite equipment, there are now foreign programs carried on the local stations. On October 1, 1991, Estonian Radio Channel 3 began relays of Radio Free Europe programs in Estonian, while a month

later the ethnic Channel 4 began carrying Russian language programs from Radio Liberty. Voice of America programs in Estonian began on Channel 3 in January.

Every evening between 5:00 and 6:00 pm local time Estonian television now relays CNN. On the roof of Estonian Television's studio building there's a large satellite reception antenna at least 3 meters/10 feet across. According to Margus Hunt, it was paid for by the United States government for relays of the United States Information Agency's WorldNet programs from the Eutelsat II-FL satellite.

The first club for radio enthusiasts in Estonia, Eesti Raadio Klubi, was organized way back in 1924. But organized DXing disappeared during the decades of rule from Moscow. The authorities discouraged listening to foreign sta-

tions, and hobbyists could find it hard to find employment. Now, some newspapers have begun printing information about satellite television, but it's still uncommon.

With the break-up of the Soviet empire, new countries and new stations are appearing across the radio dial. Because of the many problems facing those new nations, monitoring their airwaves promises to remain exciting for some time to come. Estonia is an old member of the international radio family that's once again emerged, anxious for contact with the outside world.

George Wood is a staff member at Radio Sweden and host of "Sweden Calling DXers."

Estonian Radio

The First Channel:

Tallinn	1035 kHz and 71.0 MHz
Tartu	1215 kHz
Orissaare	1215 kHz and 71.45 MHz
Kohtla-Jaerve	1332 kHz and 71.12 MHz
Paernu	1332 kHz and 71.24 MHz
Voeru	1332 kHz
Valgaerve	71.36 MHz
Shortwave (Tallinn)	5925 kHz

Volgaerve	72.92 MHz
Orissaare	73.01 MHz
Kohtla-Noemme	72.68 MHz
Paernu	72.8 MHz

Radio Tallinn in Estonian:

69.32 and 101.6 MHz

Radio Tallinn in Russian:

57.97 MHz

The Second Channel ("Vikerraadio"):

Tallinn	711 kHz and 71.78 MHz
Tartu	711 kHz and 69.62 MHz
Kohtla-Noemme	711 kHz and 71.9 MHz
Paernu	711 kHz and 72.02 MHz
Voeru	810 kHz
Haapsalu	810 kHz
Viljandi	1602 kHz
Volgaerve	72.14 MHz
Orissaare	72.23 MHz

External Service Radio Estonia:

1035 and 5925 kHz

English	Mondays and Thursdays 2130-2200 hrs UTC
Estonian	Tuesday, Wednesday, and Friday 2130-2200 hrs
Finnish	Monday to Friday 1030-1100 and 1600-1630 hrs Saturdays 1000-1100 and 1600-1700 hrs Sundays 0800-0900 hrs
Swedish	Monday to Saturday 2100-2130 hrs Sundays 0900-0920 hrs
Esperanto	Thursdays 2120-2130 hrs Sundays 0 920-0930 hrs

The Third Channel:

Tallinn	70.28 MHz
Valgaerve	70.58 MHz
Orissaare	70.67 MHz
Kohtla-Noemme	70.13 MHz
Paernu	69.92 MHz

The Fourth Channel (mostly Russian):

Tallinn	1512 kHz and 67.19 MHz
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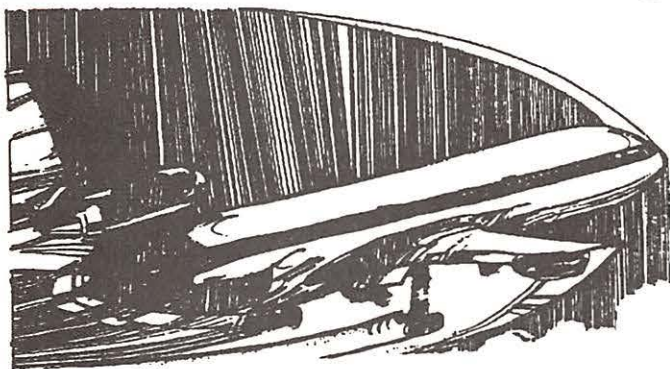
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Ringside at the Runway



Plane Spotting with your Portable Radio

By Marilyn Mayer

If you own a handheld scanner or battery-powered shortwave radio that includes the aero band (118-136 MHz) and enjoy watching planes, there's lots of excitement waiting for you at your local airport. Using your radio, you can monitor not only the control tower for takeoff and landing traffic but also other frequencies for routing, weather, fuel loading, and ground control, among others. All you need is an airport, some information about its layout, a list of local aero frequencies, your radio, and a thirst for adventure.

To get started, call the public affairs office at your local airport and ask them to mail you their standard information package. These kits are free and include lists of airlines, cargo carriers and charter services that use the airport as well as a map of the airport's layout. The map will show the runway configurations, viewing areas, observation decks, and entrances and exits to access roads. If you're interested in taking pictures of planes, you'll need to know where the access and perimeter roads are—but more about photography later.

Next: if you own a scanner, program your local airport's control tower, ground control, and clearance delivery frequencies into it. You can get these frequencies from published sources like Tom Kneitel's *Air Scan* directory or from a local scanner/shortwave outlet. Most of these stores have listings of local aero frequencies free for the asking. Or you can simply park your car at the airport and use your scanner's "search" feature to find active frequencies in the 118-136 MHz range.

If you're using a portable multi-band radio, you'll need to make a list of the aero frequencies you want to monitor and practice tuning them in on the aero band using the dial knob. As you tune in frequencies one at a time, you can mark them with a felt-tip marker on the dial face for retuning later. If your radio has digital tuning you can of course punch in each frequency; if it has a memory feature you can program the frequencies into memory and recall them one at a time.

Once you know the layout of the airport and have your scanner or portable ready, it's time to pack up the car. Your equipment should include your airport map, your radio, a notebook, a couple of pencils, and a warm jacket (airports tend to be windy places). A pair of binoculars comes in handy, too. If you want to take pictures, anything from an "Instamatic" on up will get you good results; but for really spectacular shots, a 115mm SLR with a telephoto lens 135mm or longer is just the ticket.

Now you're at the airport, and you've found a good viewing area, hopefully fairly close to one of the active runways. (Observation decks are fine for VHF monitoring but too distant from the action for all but the tamest souls.) Aero buffs usually start their sessions by monitoring clearance delivery in the 118 MHz band to keep track of which flight is going where, when they will take off (called "wheels-up time" in airport parlance), and which routing and assigned altitudes



Marilyn Mayer

United's Flight 807 to Seoul, a 747-200, lifting off from SFO's Runway 28 Right.

Table 1

Selected VHF ATC/Airport Frequencies (MHz)

118 to 121.4	Air Traffic Control
121.6 to 121.925	Airport ground control
122.0	FAA Flight Watch (private planes)
122.7	Unicom at uncontrolled airports
122.775	Comm band for fuel trucks and maintenance vehicles
128.825 to 132.0	Airline company enroute communications

Selected Airline Company Frequencies (MHz)

United Airlines:	130.25, 129.5, 129.3, 129.7, 460.825
Continental:	130.85, 130.9
US Air:	129.05, 130.075, 130.05
American:	129.0, 129.2, 129.425, 460.775
Delta:	129.5, 129.55, 129.6, 129.9, 130.1
Japan Air Lines:	131.8
Lufthansa:	460.775
Southwest:	129.25, 460.675
Northwest:	128.975, 129.95, 130.35

Major ARINC Overocean Frequencies (kHz Shortwave)

Pacific:	3413, 5547, 5574, 8843, 11282, 13288
Atlantic:	5598, 5615, 6535, 6577, 8846, 8891, 11279, 13291

they will take en route to their destinations.

Then it's time to monitor ground control in the 121 MHz band for a flight's "push-back" time—when a ground truck literally pushes a plane backwards out of its loading gate—and its final clearance to taxi to the active runway.

At small and intermediate-size airports the traffic flow is not so heavy that you can't keep track of each plane you see, but at large international airports there are fast-moving traffic patterns, multiple active runways, and a whole different set of challenges. For those of you who want to do your monitoring at international airports like Chicago's O'Hare or New York's JFK, and especially if you want to take pictures, here are some hints that may help you in the "big leagues."

First, make several trips to the airport on both weekdays and weekends to note down the flight numbers and takeoff/arrival times of planes you want to monitor or photograph. Also make notes about which runways are in use when the winds shift, because weather will dictate runway changes, often in opposite directions. Drive around the perimeter roads to check for access and security gates.

Use your map: all airport runways are designated with reciprocal headings 180 degrees apart so they can be used as opposites, i.e., Runway 10 becomes Runway 28 in the inverse. If you're new to the hobby, don't be shy about asking other aero buffs at the airport (recogniz-

able by their scanners) for information. They'll be delighted to share inside dope about frequencies, viewing areas, and other goodies, and you might make some new friendships in the process.

Information about runway shifts at international airports is vital, especially if rough weather sets in. One stormy morning last winter while at home I heard about an unusual runway shift at San Francisco International on my scanner. Grabbing the radio, I sped down to SFO 16 miles away, parked my car across from the viewing area adjacent to Runways 1R and 1L (all the spaces were already filled by aero buffs), found shelter from the wind and rain under a tree, and was rewarded with the incredible experience of a succession of jumbo jets roaring barely 100 feet over my head in steep noise-abatement turns at full takeoff power, barely clearing the blast fence next to the freeway. Due to the storm, Runway 1 had become Runway 19, with takeoffs to the north instead of to the south—such an extreme rarity at SFO that local TV stations sent camera crews out to cover it.

One of the best things about living close to an international airport is that you can combine your VHF scanner or portable multiband with your home shortwave radio to track overocean flights. It works like this: at the airport, you can monitor an overocean flight when it calls ARINC (Aeronautical Radio Inc.) in the 130 MHz band, usually a few minutes after the pilot talks to clearance delivery. ARINC will give the pilot his

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Read anything interesting lately you'd like to share with other Monitoring Times readers? Send any radio related news clippings to:

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overocean shortwave frequencies (see table) and also will check his SELCAL. The SELCAL is an acronym for "selective calling" and is a chime in major or minor thirds, for you music buffs.

When you hear the ARINC controller talk to the pilot, use your notebook to write down the flight number, the shortwave frequencies the flight will use overocean to report its remaining fuel, position, altitude, and winds aloft, and the plane's SELCAL designation. The SELCAL will always be a four-group alpha code, for example, Bravo-Delta-Foxtrot-Delta. That chime is the plane's airborne telephone number, and you'll recognize it on your home shortwave when ARINC's controllers call it on HF. This is one of the great "highs" of aero monitoring—to watch and listen to a plane take off and then follow its progress for hours afterward via HF shortwave once it's out over the sea.

If you want to take pictures, try for close-up takeoff shots—especially of jumbo jets, as they're spectacular on liftoff. Once you get to know your airport, find out where the wheels-up end of the active runway is and park as close to it as you can. Tuck the scanner into your jacket pocket and turn the volume full up so you can hear it against the wind and jet noise. If you're using a portable multi-band, pick your spot for picture-taking and set the radio firmly into the ground with the speaker side up, tuned to the tower. Take a few shots of departing planes to preset the camera's aperture and shutter speed. Then listen for the takeoff clearance of the plane you want to capture on film. Once the pilot says, "Rolling," preset your camera lens to infinity, hold your breath, and wait.

For the shot of United's Flight #807 to Seoul that accompanies this article, I had to snuggle the telephoto lens of my Pentax MESuper into one of the 4-inch openings in an 8-foot high wire-mesh perimeter fence, shielding it from the wind, and wait 25 seconds. That's how long it takes a fully-loaded 747-200 weighing 300 tons to eat up 11,840 feet of runway. Then I saw the jumbo's tail. Dead-on, a 747's tail will appear in your lens first, as it's six stories high; then you'll see the nose as the pilot rotates the plane for liftoff. After that you have about six seconds to shoot two pictures as the monster lifts off—maybe four pictures if you have a motorized drive.

Those of you with camcorders are the luckiest ones; along with the pictures, you can capture that incredible scream of four enormous jet engines lifting 300 tons of aircraft overhead at full takeoff power. And for you Easterners who live near Dulles or JFK, you can bag the biggest prize of all—the supersonic Concorde with its awesome, batlike configuration on takeoff. But remember to wear earmuffs.

If you want in on this sort of action, pack up your scanner or portable multi-band and get out to your local airport—and good aero hunting to all of you!

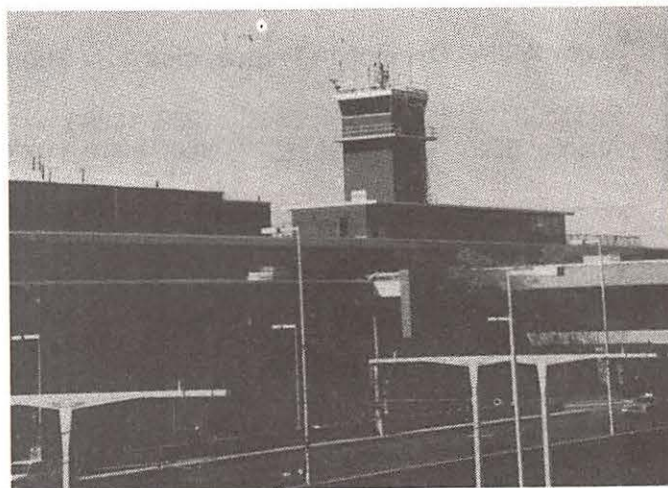
M_T



Marilyn Mayer

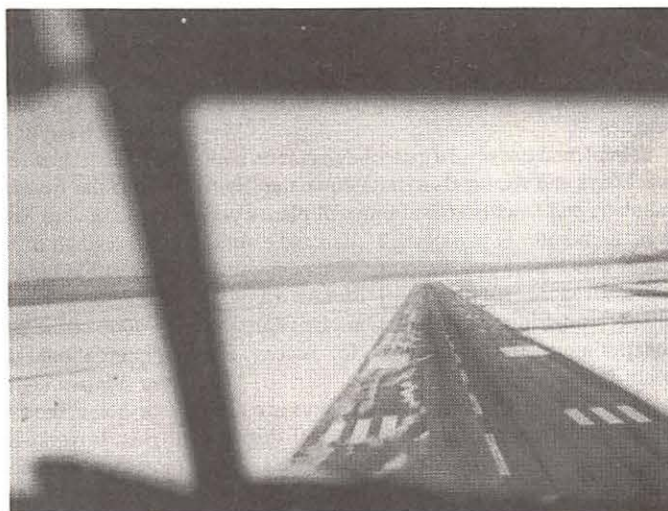
Father and son watching a United DC-8 holding for takeoff on Runway 1 Right at SFO from the auto viewing area.

To locate a good listening and viewing spot at a busy airport, a map of the grounds may be necessary.



Harry Baughn

Snow or bad weather conditions may produce some unusual monitoring, but come prepared to protect yourself and your equipment.



Harry Baughn

Showdown in Caracas

Radio Nacional Weathers An Attempted Coup

By Martin G. Delfin

The news flashed across the wires around the world while most

Venezuelans slept: Rebel military troops storm Miraflores presidential palace and the La Casona presidential residence just before midnight on February 3. I received the phone call at about 1:30 am from the person on duty at Radio Nacional de Venezuela telling me to prepare to go to the station as soon as possible to transmit live bulletins in English. No one could believe that after 34 years of stable democracy, Venezuela's

constitutionally-elected government was in jeopardy.

Local television networks, with the exception of the state-owned Venezolana de Television, channel 8, were on the air broadcasting appeals from various political leaders demanding that the rebels return to their barracks. Channel 8 was taken over by the rebels who reportedly didn't know how to operate its equipment and couldn't get a prepared videotape with their own message on the air. It was later learned that the video contained the names of a provisional president

and a new cabinet. I switched on Radio Nacional's easy-listening channel, 630 kHz, and was relieved that it was still on the air with its usual programming. The rebels haven't reached the station yet, I thought.

The director of Radio Nacional de Venezuela, Jaime Alsina, had been sick for the past few days and was unable to go to the station. The duties fell on station manager Mrs. Haydee Briceno who herself found it difficult to get to Radio Nacional. Mrs. Briceno lives 45 minutes

Two soldiers, loyal to the democratic government of Carlos Andres Perez, on patrol Tuesday in the center of Caracas. Rebel troops tried to overthrow the troubled administration of President Carlos Andres Perez early Tuesday, Feb. 4, blocking main roads into the capital and attacking his residence and the governmental palace.

Five hours after the attack, Perez claimed the attempt had not been successful.



AP Photo



AP Photo

A group of soldiers, loyal to the democratic government of Carlos Andres Perez, carry the body of a dead companion after he was shot in the head near the Air Force station of La Carlota, which was captured by rebels in the coup attempt.

outside of Caracas, and all roads leading to the capital were blocked by loyalist National Guard troops. After haggling with the commander on duty at the checkpoint between Caracas and the international airport, she was able to get through because she was driving an official vehicle. Others weren't so lucky.

Many employees were unable to make it to work that day. While I live only about 10 minutes away from the station, I had to walk because there was no public transportation. Sound engineers, producers, announcers and journalists filled in where they could since Radio Nacional de Venezuela operates four services (two mediumwave channels, classical and easy-listening pop, one FM and the international service) and there weren't many people to go around.

At 3:15 am, President Carlos Andres Perez went on the air from the private television network, Venevision, where he sought refuge after barely returning from an official visit to Switzerland. The rebels were defeated at the presidential palace and the loyalists had the situation under control, he said. Perez claimed that he was nearly assassinated and announced that he would call an emergency meeting of his cabinet as soon as he returned to Miraflores.

But the shooting continued, and we knew that it was far from over. The international service at Radio Nacional de Venezuela was busy preparing its bulletins in Spanish, French and English.

The rebels for some reason never tried to take the radio. Nevertheless, the station's staff was not taking any chances. The few security people that

are normally guarding the station's entrance were busy on the phone trying to get back-ups from the DISIP national secret security police. Radio Nacional de Venezuela is located in a strategic area. Far from the hustle and bustle of downtown Caracas, the station sits next to a police station on a dead-end street in the affluent neighborhood of Chapellin. Maybe the rebels considered that they would be easily cornered if they tried to take the radio. Their failure to do so, however, was one of the reasons why the coup failed.

It made our job a lot easier knowing that the government was determined that Radio Nacional de Venezuela would not fall into the hands of the rebels. Still, we braced ourselves as we continued to monitor the events through official communications, news reports on local radio and television, and by tuning in other international broadcasters such as the BBC World Service, Radio France International, the Voice of America and Colombia's Caracol and RCN networks.

We were told to be ready to go on the air at 1100 UTC (7 am) with our first bulletin in Spanish, English and French. And depending if there was an immediate change in the course of the events, Radio Nacional de Venezuela would go on the air at anytime. Our newscast, as always, was to be objective. We were to tell the world *everything* that was happening in Venezuela—good and bad. We were to report what President Perez had said, what the rebels were demanding, where the major battles were, what type of security was being taken at the nation's petroleum facilities, etc. It was important to provide listeners with thorough coverage because at that point,

neither news agencies nor the other international broadcast stations knew exactly what was going on.

Ironically, it was a technical problem that prevented that first bulletin from going out. The English and French language staffs, myself included, were greatly disappointed but not discouraged. We set our next goal for 1400 UTC (10 am) or earlier if necessary. Meanwhile, some of us dared to venture out in Radio Nacional de Venezuela vehicles to check out the situation while other staffers remained to monitor local radio and television, and the shortwave bands to see what others were saying.

Local radio out-did TV, since it appeared that the television stations didn't want to alarm the citizens. Radio Rumbos, 670 and 9660 kHz, and Radio Continente, 590 kHz, had the best coverage. Radio Rumbos had one reporter at the La Carlota and a battle ensued when loyalists tried to ferret them out.

Meanwhile, Radio Continente broadcast a message from one of the leaders of the rebel troops, Lt. Col. Francisco Arias Cardenas, who identified the rebels as the "Bolivarian 200 Revolutionary Movement" named after 19th century liberator Simon Bolivar. Arias Cardenas was the only rebel leader that was able to transmit the movement's message from an unidentified radio station in Maracaibo. Radio Continente re-broadcast the exclusive for his listeners in Caracas.

In neighboring Colombia, the Caracol and RCN networks, the two biggest in that country, also provided excellent coverage. Many rural Venezuelans reportedly relied on Colombian radio to find out what was happening in the capital. Venezuela's official state-news agency, VENPRES, reported from its bureau in Bogota that even Colombian President Cesar Gaviria was tuning to Caracol and RCN.

"It was so extensive—the coverage given by the Colombian mass media to the attempted coup in Venezuela—that any recently-arrived foreigner could probably think that the military assault was taking place in Colombia itself," VENPRES reported the day after the incident.

By 8:30 am, morning call-in shows on various Venezuelan radio stations were broadcasting listeners' comments in support of democracy. We continued to prepare for a now-extensive 1400 UTC broadcast. We knew this time we would be on the air and not only in Spanish, English and French, but also Creole since our announcer in that language had arrived.

President Perez, already back at Miraflores, was holding high-level talks with members of the opposition on whether to suspend constitutional guarantees and declare a state of emergency. We knew that if guarantees were suspended, it would also include freedom of expression. Radio Nacional de Venezuela in its charter is guaranteed freedom of expression even in times of emergency.



AP Photo

A heavy military presence is seen outside the Presidential Palace in Caracas on Feb. 6th, as a soldier, accompanied by an armored vehicle, keeps watch over a street. Reports suggest that the coup plot was more widespread within the military than previously thought.

As we prepared for the 1400 UTC broadcast, the shooting sounded as if the fighting was getting closer to the station. F-16 fighter jets began to buzz overhead at regular intervals. Defense Minister Fernando Ochoa Antich assured us in an interview that it was the loyalists in those jets.

At 1400 UTC (10 am) and some nine hours after it all began, we finally went on the air with our extended service in four languages. The Spanish round-up encapsulated Perez's speech during and after his attempted overthrow. Other speeches by political leaders in support of democracy were also featured.

In English and French, we highlighted everything that had happened up to that point with raw tape of gun shots and fighting for ambience.

Our Creole service also offered a roundup of the day's events, including a special call for support of democracy in Venezuela by ousted Haitian President Jean-Bertrand Aristide who had been living in exile in Caracas.

We stayed on the air well after our 1500 UTC scheduled sign-off when it was announced that the Central Information Office was planning on interrupting local television and radio for an important announcement. Radio Nacional de Venezuela would carry any announcement live in Spanish, of course, and immediately afterwards it would be up to the three other language services to broadcast a translation immediately on the air live. That "important" announcement came at 1550 UTC (11:50 am).

Rebel leader Lt. Col. Hugo Chavez Frias was brought before television cameras to offer his official surrender. He thanked all of his compatriots who supported him, asking them to lay down their arms because "the cause is lost for now."

Fighting continued around Caracas as well as in other important cities. Radio Nacional de



AP Photo

Democratic loyalist soldiers search for weapons carried by rebel soldiers who had just surrendered Feb. 4th in Caracas, Venezuela.

Venezuela was kept busy answering calls from people and various news organizations around the world who picked up our broadcast.

At 2100 UTC (5 pm), Defense Minister Gen. Fernando Ochoa Antich went on the air to report that the last rebel hold-out in Caracas finally surrendered. By the time it was over, 133 army officers and 956 soldiers were arrested for taking part in the coup that took the world by surprise. Ochoa Antich denied that 300 people died during the fighting and released conservative figures of 14 dead and 57 injured.

Sobering Thoughts

In the developing world where state radio takeovers are naturally the key ingredient to any successful coup, it was the downfall of the rebels in the beginning not to do so.

Lt. Col. Chavez Frias, the rebel leader, in an interview published several weeks after the coup attempt, admitted that their number one failure was not taking Radio Nacional de Venezuela. He wouldn't give any reason why the rebels didn't try to take it, nor would he speculate if it had been part of their plans.

At the station, several of us got together in the aftermath and asked what would have happened if the rebels *had* appeared on our doorstep? Our answer, which came from a top official at Radio Nacional de Venezuela, was: "We would have had to let them in, considering that they had the guns!"

M_T

Martin Delfin, a U.S. citizen, is the English-language news director at Radio Nacional de Venezuela.

Radio Nacional's English Service

It began as a foreign service to inform listeners around the world of Venezuela's position during the Persian Gulf War. After all, Venezuela was in a precarious position: on one side, a solid member of the Organization of Petroleum Exporting Countries, and on the other hand, committed to provide a reliable source of oil to North America in times of crisis. This was the crisis.

The Persian Gulf War began in mid-January 1991 and soon after the English service went on the air with its first broadcast. Similar broadcasts were also begun in French.

This was not the first time Radio Nacional broadcast in foreign languages. In the 1970s, it had transmissions in English, French, Portuguese, German and Arabic. What happened, you ask? Well, what happens to any national foreign service during an economic crisis? After the oil boom burst, Radio Nacional didn't escape the budget ax.

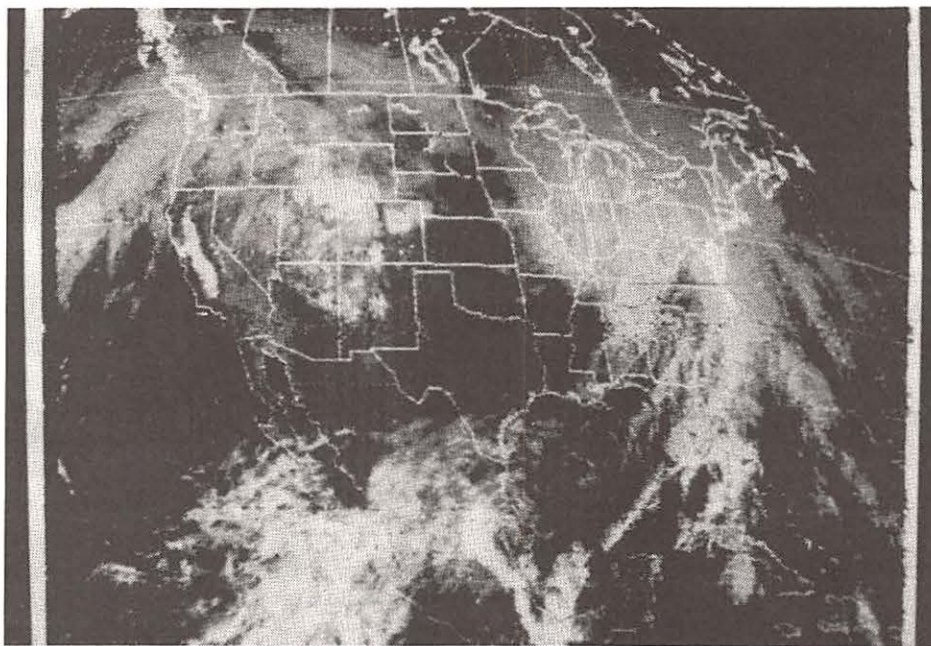
Although today's foreign language service does not compare with that of the 1970's, newscasts are compiled by looking for those interesting and important items that we hope will catch your attention. We're dedicated broadcast journalists with years of experience in Venezuela and abroad.

On Saturdays the English service presents "Crosstalk," a feature program with interviews. Be they visiting heads of state, politicians, diplomats or just everyday people, the people all have something in common - they are helping Venezuela become a leader in this new world order.

As with any international broadcaster, we get hundreds of letters every month. Our 50 kilowatt transmitter reaches many exotic places. Most of our letters, however, come from the United States, Canada and Australia. Almost everyone who writes complains that our broadcasts are too short. This year, we hope that will not only change, but that we'll be able to bring back Portuguese as well.

The FAX on the Weather

A typical satellite photo which is transmitted several times a day by the U.S. Navy in Norfolk. Note the dense fog in California's central valley.



Weather Watching by Shortwave Radio

Story and photography by Bob LaPree

The impact of weather on our daily lives is one of the universal elements of human existence. But many radio hobbyists seem to have a more than casual interest in weather watching. (Have you ever listened to ham radio operators on the air?!) Recent advances in radio and computer technology have made it possible to join these two hobbies into a single, fascinating pastime. Using your radio and your home computer you can now receive satellite images and weather charts with the same, or even better, quality than those used by your local meteorologist.

With today's reasonable cost of shortwave radios and computers ever more present in the home there is a great opportunity for those interested in weather to avail themselves of a wide array of weather data and imagery. The shortwave receiver must be capable of stable single sideband reception and you'll need to install a demodulator and software program package in your IBM compatible; with those minimal requirements, it is a simple matter to receive, manipulate, enlarge and store weather maps and satellite photos.

The last couple of years have seen computers with incredible speed, versatility, memory and ease of use which cost nearly \$5000 a few years ago now selling for under \$2000 and many are

dropping below \$1000! Ease of use is perhaps the greatest improvement for the non-technical user. The development of Windows and similar software has made it possible to perform nearly all computing without ever typing a computer language command. So what's your excuse?

Watching the Weather Channel

A wide variety of weather charts and satellite images are transmitted in a data mode called radio facsimile 24 hours a day from stations all over the world. This weather data is compiled and transmitted by the national meteorological offices of many countries.

The U.S. Navy broadcasts to its fleets worldwide on a 24 hour basis, while the U.S. Coast Guard sends out charts during two daily transmission periods from several sites along the U.S. coast. Here in the Northeast it is easy to receive clear signals from the Navy in Norfolk, Virginia, from the U.S. Coast Guard in Boston and Canadian Forces in Halifax, Nova Scotia.

Other regions in the U.S. will have similar access to good signals—even the Midwest, which can easily pick up signals from Offutt Air Force Base in Nebraska and Great Lakes transmission sites.

Weather information available from these sources is tailored to the needs of the intended user. The Navy sends out charts and photos that provide the fleet and aviation interests with relevant data. The Coast Guard transmissions are aimed chiefly at maritime and fishing interests. The information in all these broadcasts are all in the public domain, available for use by all who receive it.

While much of the information sent is highly specific, such as upper level wind patterns and wave height predictions, there is much information which is of interest and value to the casual and serious weather watcher. Charts predicting weather conditions 24, 36, 48 and 84 hours in advance are sent twice daily. There are maps similar to those published in newspapers showing fronts, clouds and precipitation areas and types. Compilations of weather data from meteorological offices within a region show symbols for weather observations which include temperatures, dew points, wind speed and direction, barometric pressures and tendency, cloud types and current weather.

The View from Afar

Among the most interesting products are the satellite photos sent several times daily. These

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Pearl Harbor, HI	4855*, 8494*, 9090*, 9396*, 14826*
Rogers City, MI	2195.5, 5898.6
Offutt AFB, NB	5096*, 6904*, 10576*

are pictures taken by weather satellites from geostationary orbits over the equator. Because their orbital speed matches the earth's, the satellites can photograph the same area 24 hours a day. The cloud cover photos that TV weathermen use are produced by these satellites.

These photos are received by the Navy and rebroadcast over shortwave 10 times a day within 15 minutes of being taken so that you can see a very timely picture of the earth's weather. There are two full view shots daily covering the Western Hemisphere between the polar ice caps. The remaining eight photos are of either the whole of North and Central America or include the eastern United States, Gulf of Mexico and western Atlantic.

Even for the untrained, it is very easy to pick out storm systems, frontal boundaries, and thunderstorm cells. During the Atlantic and Pacific hurricane season it is fascinating to see these giant storms develop and move.

Facsimile or "fax" is a system of image transmission using a rotating drum (or flatbed) which has the photo or chart wrapped around it. As the drum rotates at a precise rate a focused beam of light is projected on the image and reflected back to a photocell. The rotation of the drum provides the horizontal scan, while the light source and receptor slowly move down the length of the drum to provide the vertical scan. Average transmission time is about 8 to 10 minutes and provides resolution of around 100 lines per inch.

To translate an image into a radio signal the photocell responds to the reflected shades of light and dark by varying its voltage output. These voltage variations are amplified and used to modulate an audio signal. The whiter the image, the higher the audio frequency, with darker tones converted to lower frequencies.

When you hear a fax signal it has a definite beat to it at a rate of 120 cycles per minute with a scratchy sound between beats. The beat is the

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April and May
1990 issues of
GST magazine

Achieve professional results—often surpassing the capabilities of local TV weather reporting. Plug It! into your receiver earphone jack and decode all APT modes: GOES & Polar satellites as well as HF Marine fax. Capture, enhance, print gray scale weather facsimile using your PC. Latest technology for optimal noise rejection, self-test modes, advanced menu-driven software and help windows assure easy operation.




Half-sized card plugs into your PC.

LOOK AT THESE FEATUR

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- Integrated GOES-TAP and WEFAX animation option
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Name _____					
Address _____					

Phone _____					
Complete kit/software	Qty	Price	Total		
Assembled card/software		\$355			
Animation software for GOESTAP/WEEFAX		\$495			
Foreign orders - add \$14 shipping		\$125			
Total					



OFS WeatherFAX

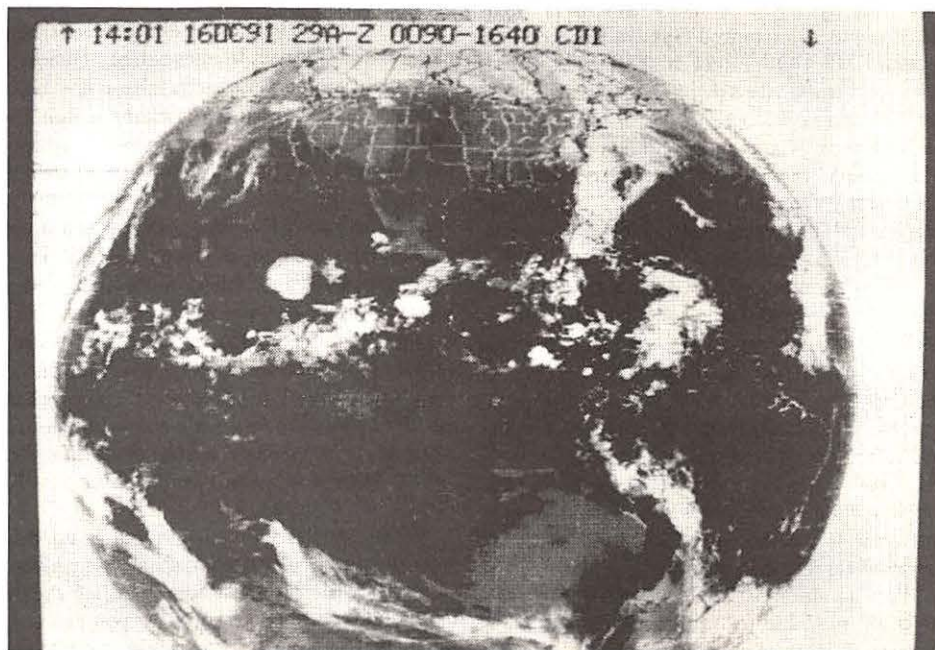
VISA

6404 Lohrman Court
Raleigh, N.C.
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Attention non-rocket scientist moms, grandmas and working gals...steal your significant other's radios and tune in while you are kinking your hair in the morning — you can hear some interesting things — unless, that is, your neighbor runs the garbage grinder.

Gigi Lytle, Lubbock, TX



The Western Hemisphere is seen in an infrared photo made by a geostationary weather satellite. It shows a large northeast coast storm system and a developing Pacific hurricane off the western coast of Mexico.

sync pulse that defines the edge of the image and the scratchy tone is the gray scale being sent.

Signal reception is fairly easy. With a longwire antenna hooked up to a Sony 2010, the Norfolk signals consistently come in at 7 or better on the signal meter at my location in New Hampshire during the day. I have found nighttime reception to be less consistent and subject to fading. However, all broadcasters use several frequencies; most shift to the lower frequencies for night path transmissions, so finding a clean signal is a good bet. A signal level of 3 will provide acceptable results. Stronger signals will improve the quality of the charts and photos with better definition and less "snow" in the images.

A note about tuning: While the published frequency may be 10865 kHz, tuning to 10863.1 LSB (lower side band) will give the proper tonal reproduction, and tuning 1.9 kHz above the frequency will result in a negative image. Through experience I have found operator error at Norfolk sometimes causes transmissions to be sent a bit off frequency—not much of a problem for charts but photos lose much of their tonal detail. If a sharp image is important, monitor at the start of reception so that minor adjustments can be made in tuning to optimize reproduction.

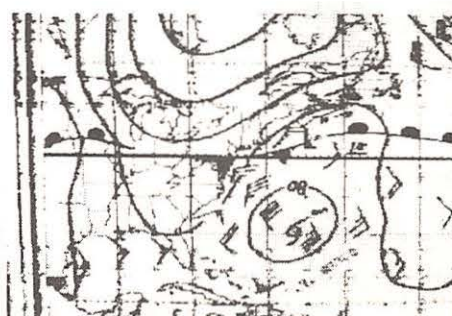
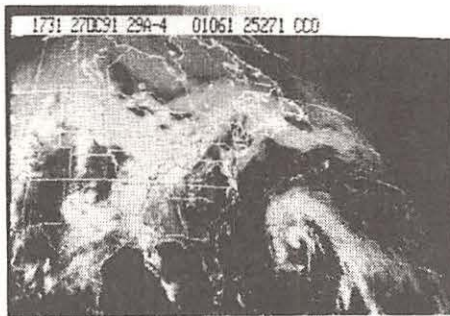
Necessary Equipment

Aside from a radio with stable SSB reception capability and a good antenna, an IBM compatible computer is required. System requirements include: MS DOS 2.1 or higher, 512k RAM, serial port and a video display. A hard drive and parallel printer are options you'll want. Add to the computer a signal demodulator (a device which plugs into the serial port and converts the audio signal from the radio into computer language) and its customized operating software, and you're in business.

There have been a few demodulators on the market for several years capable of handling FAX; most would display charts nicely but had no gray scale—just black and white tones. The last year or so has seen the introduction of products which allow the user to receive, manipulate and store images with up to 16 levels of gray. Their ease of operation is remarkable and the sophistication of image handling is astounding in part because the well written software uses the power of the PC to its fullest.

Perhaps the most sophisticated product for the price available to the hobbyist is Software Systems Consulting's PC HF FAX package (around \$100). While the product is extremely versatile, it is very easy to use. Having used it for several months now I'll touch on the basics of its operation as a representative illustration of what current software is capable of doing.

Getting started with PC HF FAX is simple.



An intense late season tropical storm is seen making its way toward the northeast coast in this satellite photo which has been cropped with the software's zoom feature. The US Navy-produced weather chart (also cropped) shows the same storm which caused extensive coastal damage in the Northeast in October 1991.

Plug the demodulator into your computer's serial port, run a line from the radio's external speaker or carphone jack, load the software, set the parameters and you're ready for business. The 200 page manual is highly readable and instructive. It includes an extensive and detailed list of station frequencies and schedules (which is also included in the software so that you can search by time, station or product and set up automatic image capture). Once tuned to a station you can manually start capture or set it to auto start which will automatically start and synchronize at the beginning of each transmission.

The captured images are easily stored to disk, either hard or floppy. Images can be lightened or darkened, contrast changed, false color added. Zooming in on a section maintains a high level of detail which can be stored and/or printed out—the results on a 24 pin dot matrix printer are quite good.

All functions and image manipulations are completed with one or just a few keystrokes. With proper tuning (there is a tuning scope feature which permits very precise and automated fine tuning of the signal) it is possible to capture 14 to 16 shades of gray in a satellite image resulting in a very detailed image. You can use the frame looping and slide show functions to show the progression of a front or storm system with your own series of satellite shots, just like the TV weatherman.

You don't need a dish to pick up these satellite signals—just equipment you probably already own. With the additional of the fax demodulator and some software you can enjoy the display on your screen, or print it out in hard copy.

For more information on HF Facsimile see the review in the April issue of *MT*. Two other *MT* advertisers also sell weather fax packages—AEA FAX by Advanced Electronic Applications (PO Box C2160 Lynnwood, WA 98036; 206-

775-7373) and OFS Weatherfax (6404 Lakerest Court, Raleigh, NC; 919-847-4545.) These have not yet been reviewed in *MT*, but reviews can undoubtedly be found in amateur radio magazines.

Regardless of the software you choose, it has never been easier to get a satellite's view of the weather. I guarantee you hours of fascinating weather watching and an entirely new way to enjoy the world of radio.

MT

Sources:

Worldwide Marine Radio facsimile, Broadcast Schedule Alden Electronics, Washington St. Westborough, MA. 01581

PC HF Facsimile 6.0 User's Manual John Hoot, Software Systems Consulting, San Clemente, CA.

The ARRL Handbook For Radio Amateurs, 1992 American Radio Relay League, Newington, CT 06111

Facsimile Product Guide, Aid to Interpret HF Radiofax USN Eastern Oceanography Center, Norfolk, VA distributed by Alden Electronics, Westborough MA.

Cover photo: North America as seen in a false color enhanced photo made by a U.S. geostationary weather satellite. The image was transmitted by the U.S. Navy over short-wave, received on a Sony 2010 and processed through an IBM compatible computer using Software Systems Consulting's \$100 PC HF FAX demodulator and software package.

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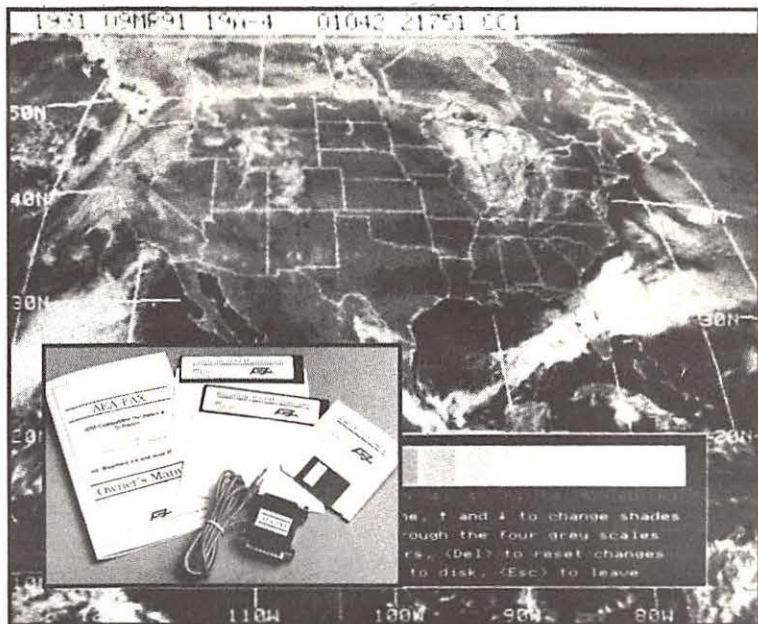
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The PK-232MBX is a must for the digital Shortwave Listener. By far the most popular multi-mode controller ever, it can receive seven different types of data signals including Morse code, Baudot, ASCII, TDM (Time Division Multiplex), WEFAX, NAVTEX and Packet. It also features: The indispensable SIAM which automatically identifies many types of digital signals; superior software support for PC compatible, Macintosh and Commodore 64 and 128 computers.



AEA-FAX is simply the best way to demodulate multi-level grey scale fax images received by your general coverage receiver. All necessary hardware and software is included in the package which also features: On-screen tuning "scope"; Autolist feature for unattended image capture and save-to-disk; "Daisy-chain" external RS-232 input allows AEA-FAX to share a COM port with a PK-232MBX or other Hayes-compatible device; up to 16 grey levels (VGA); also supports EGA, CGA and Hercules formats; prints to HP LaserJet or Epson compatible printers.

Vive La Difference

By Charles Sorrell

So, what's on tonight? Getting a little tired of "The Mailman Cometh" on Radio Liechtenstein? Had it up to here with "Today in Our Capital City" and shortwave programming in general? If you're a dyed in the wool DXer, maybe you're tired of chasing Bolivians that never seem to show in the headphones, or you need no more of reading endless repeat loggings of the same ho-hum African stations showing up on the same frequencies and in the same time periods month after month.

What you need, my friend, is to freshen up your outlook! For there is more to hear from shortwave broadcast stations than the traditional tried and true features and programing. More to seek out than hot, one kilowatt DX catches or the latest new frequency from some international broadcaster.

There's another element to explore on the SWBC bands, one that combines both listening and DXing: the Unusual—things which range from somewhat to very offbeat. A number of SWBC listening fans get a special kick from going after these unusual program sources, transmitter sites, oddball relays and broadcasting situations which directly (and historically) reflect the topsy turvy world in which we live.

Did you know there is a "hidden" country on the air? That you can hear FM on shortwave from the United Arab Emirates? And a mediumwave station in the Sudan? How about clandestine broadcasters that have gone straight, or a transplanted Papua New Guinea station? There are a whole lot of things on shortwave that aren't the same old run-of-the-mill programs or DX targets; programs that have a special flair to them.

Sometimes these things show up in the monthly SWBC news columns but, just as often, they are buried in the fine print of a program schedule or lost in the detail of a *World Radio TV Handbook* listing. Finding them, tuning for them, logging them and QSLing them can be a special kick—and it seems to be developing into something of a third stream interest among shortwave

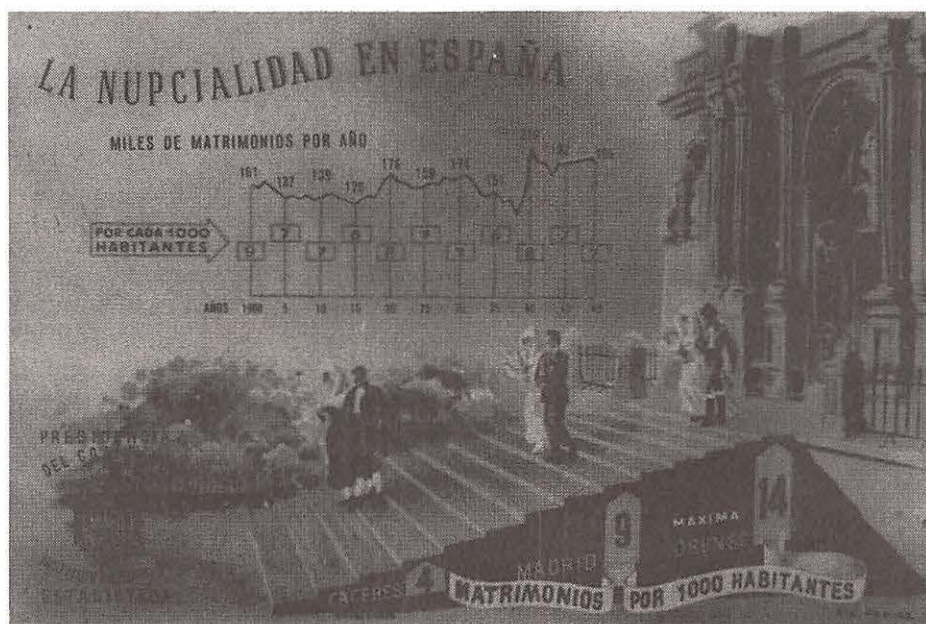
broadcast listeners. Any SWBC DXer with a couple of year's experience has probably run into this kind of thing at least once in his or her career but hasn't even begun to tap into all of the possibilities.

If it sounds like something you'd like to try your hand at, then read on, because our purpose here is to introduce you to a number of these offbeat tuning targets.

What about that "hidden country" we mentioned? Well, some years ago, Radio Yugoslavia upgraded their facility by adding a 500 kilowatt installation at a town called Bijeljina. That location now lies within the new self-proclaimed Republic of Bosnia and Hercegovina. If the area stays independent...that is, if the Serbs don't take it back by force as they are now trying to

do...there's your new country. Most of Radio Federal Yugoslavia's higher frequencies seem to involve this site. Check for the North American Service in English at 1130 on 17740.

FM on shortwave? Capital Radio is an English language commercial service on 93.5 in Abu Dhabi, United Arab Emirates. The Radio of the United Arab Emirates, which operates the station, relays Capital Radio as part of its shortwave service. Check 13605



This old card from Radio Nacional Espana was in use when Radio Espana Independiente broadcast from Romania. Now REE will control those transmitters!



INTERNATIONAL CALLSIGN HANDBOOK



After years of collecting and verifying tactical callsigns, Gayle Van Horn has finally published the most exhaustive list of tactical callsigns and their identifications ever assembled for shortwave and scanner listeners. Now you, the radio listener, can get this massive, 250 page directory!

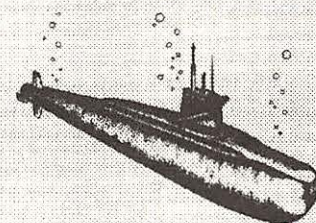
You will now know what all those codes from the US Air Force, Navy, Army, Customs, Secret Service, Marine Corps, and foreign military actually are! Internationally registered callsigns and their users around the world are listed as well, with comprehensive entries from coastal maritime stations, embassies, merchant marine, aviation, NASA, US and foreign military, Interpol, MARS, and many more!

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at 2300. Some SWLs have received separate QSLs for this.

The transplanted station? The turmoil on the island of Bougainville, North Solomons, which has declared its independence from Papua New Guinea, has forced Radio North Solomons to evacuate after the area was lost to the Bougainville Revolutionary Army. The station continues on the air, however, operating from Rabaul and still using its regular frequency of 3325. Check it before 1100 UTC since word is the sign-off time has retreated to that hour.

And the reformed clandestines. Well, Radio Miskut, which used to be an anti-Sandinista broadcaster speaking for the Miskut indian population is now operating openly from the town of Puerto Cabezas. It is listed for 5970 but at this writing, actually heard on 5560. The sign on is scheduled for 1100 and sign off at 0359, though it sometimes runs later.

Another one which has gone straight is the FMLN's Radio Venceremos in El Salvador, which now even talks about carrying commercials! It is still heard on shortwave, variously on 6250, 6300, 6700 or 6740 at various times between 0000-0400.

NATIONAL BROADCASTING COMMISSION PAPUA NEW GUINEA



Radio North Solomons has had to leave Kieta and move to Rabaul.



BRT in Belgium offers a chance to hear that nation's domestic German network on shortwave.

Do you believe in ghosts—in voices from the past? You can tune one in the form of Radio Monte Carlo which, years (and years!) back was a regular shortwave broadcaster. Radio Monte Carlo now airs a brief French language broadcast to Canada via RCI's Sackville facility. It's on 5960 from 0400 to 0415.

A ghost of another sort is the coming return of a transmitter used by the communist-run clandestine Radio Espana Independiente, which has been off the air since 1977. The transmitter site, owned by the government of Romania, is being dusted off and will be used by—all stations—Radio Exterior de Espana as part of their expansion. Something to watch for since, as of this writing, it wasn't yet on the air.

Any SWL knows that religious programming seems to dominate the bands these days, so you wouldn't think that one more such station would be anything unusual. But this one is. Radio Rodunehz broadcasts on behalf of the Russian Orthodox Church, and it operates from Russia! Some North American listeners have already spotted this fairly new entry into the religious radio ranks. Look for it from 1128 sign on 11675, all in Russian. Incidentally, there are at least two other religious broadcasters on the air from Russia now and probably more to come! Adventist World Radio and Far East Christian Broadcasting are both active on shortwave now, using ex-Radio Moscow transmitting sites!

The Sudanese mediumwave station we mentioned up front is Radio Juba, from the town of

that name, which has a 100 kilowatt station on 693 kHz and is sometimes relayed by the main shortwave station of the Sudanese government between 1400 and 1500 on 9550 (sometimes 9540). As SWLs know, the Sudanese situation is unsettled at best, so this broadcast may be very sporadic.

Another mediumwave station that is reported to be carried on shortwave is Radio Zahedan, in Iran, which uses 100 kw on 777 kHz. The main government facilities are said to be relaying this between 1530 and 1630 on 11930.

Belgium's BRT broadcasts on shortwave every day. Belgium's French language service, RTBF, which used to have its own station, is still heard on shortwave via BRT's facilities. But Belgium has a third network which is also supposed to be on shortwave. BRT is supposed to carry a 25 minute broadcast from BRF, the

domestic network which broadcasts in German. It is scheduled on weekdays at 1130 on 9855. This oddity has been listed in the *WRTH* for several years but is seldom, if ever, reported.

Most DXers seek out RAI-Caltanissetta (Sicily) because it counts as a separate country on some lists. These frequencies (6060 and 9515) relay the domestic Radio Uno network. But you can also hear the domestic Radio Duo network on shortwave (7175 between 0500 and 2300)

Still in Europe, have you tuned for Bulgarian Radio's medium wave domestic service? It's called Radio Horizont—a 24 hour music and news service and it's relayed on shortwave on

11660 between 0830 and 1900.

We tend to think of Radio France International as another of the major powerhouse international broadcasters, armed to the guy wires with 500 kilowatt transmitters and relays sprinkled around the globe. But RFI continues to operate one tiny voice on shortwave that uses only four kilowatts. It operates on 3965, targeting Europe between 1700 and 0900.

Some English language oddities: Polish Radio Warsaw dropped English for North America a few years ago. But now they have an English service for the South Pacific—of all places! It's scheduled on 6135, 7270 and 9525 from 0630 to 0725.

The stations of former French Africa aren't at all big on English broadcasts, but here's one that might be of aid to the DXer who needs a QSL from the Ivory Coast. Radio Cote d'Ivoire's Channel Two service is reported to carry English on 11920 between 1800-1900. If you're one of the many who have trouble QSLing this country, a report direct to this program might be the opening you need.

There are a couple of unusual shortwave things coming out of Taiwan. The "Voice of China" is believed to be a feature which replaced the Voice of June 4th program that had been produced by a US-based Chinese student group. The Voice of China is said to be an anti-mainland government program produced by Taiwan students. It airs on 15280 between 2100 and 2200 (all Chinese, of course) on the Central Broadcasting System which beams to the mainland on shortwave as well as mediumwave.

Another unusual program on the Central Broadcasting System is the Voice of Free Asia, scheduled at 1530 to 1630 on 11905. This feature—half in Chinese and half in Korean—isn't produced by CBS, or even produced in Taiwan at all. It's a product of the Korean Broadcasting System! Wouldn't it be a neat trick to get a QSL from KBS for the broadcast over CBS, Taiwan?

Yes, one can get bored just listening to the usual programs on shortwave month after month and year after year. And, yes, one can tire of the same old DXing routine of hearing 'em, reporting 'em and QSLing 'em. Adding this third "offbeat element" to your listening formula is a great way to give your listening a shot in the arm. Like the programming and the DXing sides, the offbeat side has endless twists and turns which means there are always new targets to go after. But you may need to stay alert in order to spot the fact that they exist!

If you start drawing from all three aspects in your shortwave listening, it's more than likely there'll hardly ever be a time when you turn on the receiver and decide there's nothing on of any interest. There's a lot more to listen for!

MT

When it Rains in Southern California... Man it Pours!

By Steven Dooner, KCA6VB

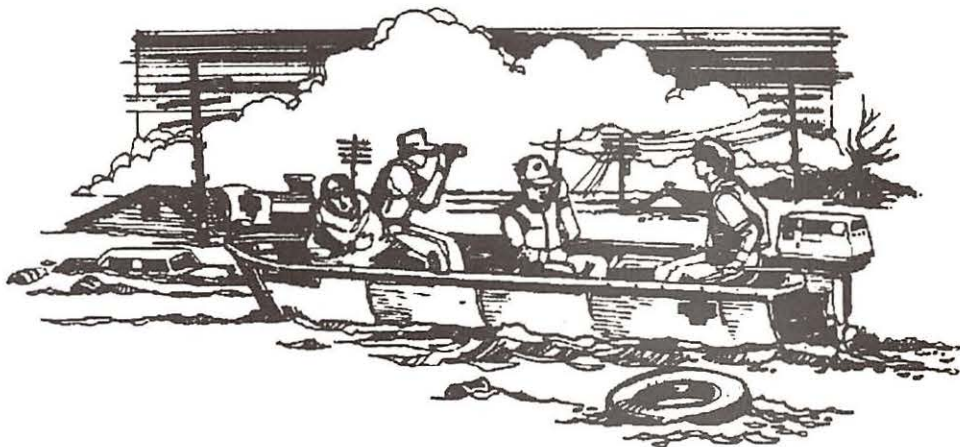
Thousand Oaks, California

On Monday, February 10, a violent rain storm hit Southern California, most notably, the San Fernando Valley region of Los Angeles. In a matter of a few hours, over eight inches of rain fell in parts of this valley. Granted, there are parts of the country where this much rainfall occurs and doesn't make the national news. But when it arrives after six years of drought, in an area that averages only slightly over 20 inches of rain yearly, you have a mess on your hands!

Unfortunately (for me, anyway), I was away from my monitoring post during the first of three storms to batter the Los Angeles area. In fact, I was driving (what a dolt) across the San Fernando Valley during this storm.

On Wednesday, the second storm came ashore north of Los Angeles and started to clobber the Santa Barbara area. Ventura County was the next area hit, and this time, I was at my listening post. The rain was falling at over an inch an hour, and if you live in, or have visited Southern California you'll know that we are full of mountains that drain right down to the ocean.

The first call I monitored concerned two school buses full of children trapped in a mudslide. I was also watching the LA TV stations, and noted that they were either very slow in covering activities in Ventura County, or weren't covering them



at all. I called the NBC affiliate and informed them of the bus situation. It was then that I found out that they and their counterparts had no way to monitor Ventura County communications due to the distance and intervening mountain ranges. My phone did not stop ringing the rest of the day with TV stations calling for updates!

I was able to direct a TV helicopter to a man and his dog stranded at a trailer next to the Ventura River which was above its banks. The Sheriff's helicopter was trying to get to him, but was several minutes out. The TV helicopter found the man and rescued both man and dog.

The communications were fast and furious for several hours as the various agencies involved went to work. The Ventura County Sheriff has its own Search and Rescue Team that was quickly activated and went to work pulling people off of the roofs of their campers that were caught in the flooding river.

My monitoring station consists of an AR2500, BC250, Pro 2004 (modified) and a Pro 32 portable. Between fire, sheriff, CHP, and various police agencies, these radios really got a workout!

As the rains continued, so did the mudslides and floods. I monitored fire crews going from one house to the next sandbagging and digging trenches trying to stem the flooding waters. At one point, a road crew was hit with a wall of water, and their supervisor had lost radio contact with them. Fortunately, they were rescued by the fire department, unhurt. By late afternoon, when the rains had slowed, I was exhausted. The TV stations wanted to know if I would be monitoring on Friday and Saturday when the biggest storm of the bunch was supposed to hit.

I stayed up all night Friday waiting for, as one TV weatherman called it, "the Mother of all Whoppers" to come ashore. The scanners were

remarkably quiet until dawn. The CHP was the first service with much activity. Units were beginning their watch and were joking as they signed on calling themselves "3180 Noah's Ark 10-8."

At about 6:15 am the rain really started to fall in Ventura County again. Cal Trans was dispatched for floating debris on one highway as everyone braced for the worst. By 7:15, the flooding calls were coming in about one every three minutes. Cars were sliding over the sides of freeways as some "typical" Southern Californians still don't know quite how to drive in the rain.

The CHP was reporting "blinding rain" at about 8:25 on one highway, and the Sheriff's department was asking units to check bridges for water levels. Meanwhile, the Search and Rescue people were deployed at various locations waiting to be dispatched.

Then, by 9:00 am, the rains slowed down and the sun came out. The various agencies began to stand down, and it looked like the "Mother" wasn't going to be so bad after all. When it was all over, six hours had passed and there had been 13 flooding/mudslide/rockslide calls, one plane crash, seven freeway traffic accidents, two structure fires, three vehicle fires, and a lot of reports of children swimming and surfing in the flood channels.

MT

Table of Frequencies Monitored

California Highway Patrol

42.400 Purple base

42.160 Purple mobile

Ventura County Sheriff

159.210 West Dispatch Ch. 1

156.150 East Dispatch Ch.3

155.160 Search & Rescue

Ventura County Fire

154.010 Dispatch

Plus various secondary channels used and other law enforcement agencies such as Ventura and Oxnard PD.

Has radio monitoring led you on an adventure? Take the time to write it down and submit it for publication. Send it to:

Editor
Monitoring Times
P.O. Box 98
Brasstown, NC 28902-0098

Shortwave Broadcasting

Glenn Hauser

Box 1684-MT
Enid, OK 73702

ANGOLA Luanda on 3376.8 from 1900 past 2200, all-night, and around 4950.8. Benguela regular eves until 2203 sign-off//5041.3. Lobito reactivated on 7151.7 around 0600. VORGAN at 0440-0800 on 9700 and new 7290, 6045 (Vashek Korzinek, South Africa, via Dario Monferini, *World of Radio*) Tnx to this tip, 7290 heard from 0441, but best on 9700 on 0600-0700 window between Germany and New Zealand (Brian Alexander, PA)

ARGENTINA Add a third mystery relay, Radio del Plata on 26139, finally IDed at 1605; informal ID is "mil-treinta." One day at 1205, 26299 carried Spanish numbers for half an hour instead of R. Nacional, much stronger than the other two (Alan Roberts, PQ, *W.O.R.*) Not from R. Nacional site, presumably military relays for Antarctica like 15780 ISB. R. Nacional 6060 broke down and may not be fixed, but is on 5855 nightly (Gabriel Ivan Barrera, Buenos Aires, Radio Nederland Media Network and Radio Enlace)

AUSTRALIA Radio Australia's *Communicator* has moved from Sundays to Tuesdays (Joel Ribera, Frank Orcutt, John Norfolk, *W.O.R.*) New female host Shawn Pryor has a lighter Strine accent than her predecessor; shortwave topics still taboo, best at 1130 on 9580 (gh) Other times are 0930, 1530, 1730, 1930, per new June guide; some other programs: *Blacktracker*—Aboriginal music, Wednesday 1030, 1430, 1830, 2030. *Fine Music Australia* at same times on Friday. *Music Deli*—from variety of cultures, Saturday 1030, 1230, 1430, 1830, 2030. *One World*—environmental issues, Wednesday 0930, 1130, 1330, 1730, 1930. *Soundabout*—contemporary music with a listeners' club, Monday-Friday 1230. *This Australia*—documentaries, Monday 1130, Tuesday 1330, Wednesday 1530, Thursday 1730, Saturday 1930 (via Mickey Delmage, Alberta, *W.O.R.*)

BELARUS Radiostantsiya Belarus in Belorussian to America at 2330-2400 on 15580, 13645, 11780, 10344=USB, also announced 11870. 1830-1900 broadcast has Radio Minsk in German on Wednesday, Saturday; religious program from Switzerland, *Die Antwort* on Sunday; Belorussian other days all on 11960, 9600, 7330, 7210 (BBC Monitoring)

BENIN Last month's 5025 would have been the Parakou regional station.

BOLIVIA Radio Emisora Mamore on new 4731.58 ex-4739, very poor from 2254 to anthem and closing at 2405 (Juan Carlos Codina©, Peru, via Dario Monferini, *W.O.R.*) New station is Radio San Ramon (de la Ribera) on 5721.75 varying to .71, at 0300 one night, until 2300 following nights (Codina via Monferini, RN Radio-Enlace)

BOTSWANA R. Botswana intermittently daytimes on new 9600 (BBCM) Used years ago, too.

BRAZIL RNB's new 15445 at 1200-1320 has held up well, except one day when audio cut out every three seconds (*W.O.R.*)

BULGARIA Last month, DX program timing should have read 30 minutes into 45-minute segments.

CANADA CBC and RCI *Sunday Morning* has cut to less than one new hour each week at 1311-1359; *Centerpoint* has been repeats; and third hour carries two series through Sept. 6, *Cranial Pursuit*—all about the brain, and at 1530, *Departures*—world travel; on 17820, 11955, 9625 (*W.O.R.*) Mischief on BBC relay 9515 after 1745 closing; often stays on with comedy piece or novelty record, cut just as a naughty word is about to be uttered (David W. Harris, NH) Somebody in London or Montreal playing around with feed circuit?

CHINA Radio Beijing is promoting a trip to China, Jan. 8-19, 1993 for \$1755, land & air from Los Angeles, visiting Shanghai, Guilin, Xi'am, Beijing; info from Good Earth Travel, 1-800-892-2125 (via Diane

Mauer, Steve Hunter) Also sent list of 17 Chinese music cassettes costing \$5 each postpaid, from Mr. Li Yi, English Department (Gigi Lytle, TX)

CPBS Taiwan Service active frequencies: First Program on 15710, 11935, 11100, 9455, 9380, 3815. Second Program on 15880, 11000, 9170, 6790, 6097/6095. Voice of the Strait, Fuzhou, First Program uses 11590, 7280, 6115, 5508, 5050, 4940, 4130, 3955, 2755; Second program on 9505, 6000, 4900 (BBCM)

COLOMBIA DST experiment of UTC-4 lasted only one month, May (Yimber H. Gaviria, *Play-DX*) Radio Catolica, Narinyo area but site unknown, again on same frequency as a year ago, 3579.86 around 0200 greeting listeners in Ecuadorian border area (Codina via Monferini, *W.O.R.*) Radio Buenaventura, 4833+ reactivated, address not in *WRTH* is Calle Uno, No. 2, Espacio 39 Piso 2, Buenaventura, Valle del Cauca; Gerente is Mauricio Castano (Gaviria via Monferini)

COMOROS 3330 is reactivated, but mixing with Rwanda on exactly same frequency, 0300-0500 (Vashek Korzinek, South Africa, via Monferini, *W.O.R.*)

CONGO 4765 has transmitter breaks; only regular is 6114.6 from 0357 (Korzinek, *ibid.*) Radio Congo, 15190, heard from 1200 in French and vernacular until 1400 closing, strong (Ernie Behr, Ont.) SWBC harmonic from Brazzaville is widely reported on 50067 (Sheldon Remington, HI, *Fifty MHz DX Bulletin*) Most likely fundamental would be 7152.4, but see ANGOLA.

COSTA RICA Radio Nacional de Espanya—Radio Exterior has been testing, expects to begin regular relays in mid- to late- August on 8, 6, 9, 11 MHz bands between 2200 and 0500, elsewhere used by C.R. government (Jose Martinez Nicolas, Madrid, RN MN and Radio Enlace)

R. Universidad reactivated 6105 again early June, 0212 past 0315, playing non-stop music but different types from night to night—rock, classical (Bill Flynn, OR, *W.O.R.*)

TIAWR interfered with itself for a couple of days, Alajuela on 9725.1, Cahuita on 9722 is at 2300-0100 in English, then only the latter (Ernie Behr, Ont., *W.O.R.*) Admitted on *Costa Rica Today*, Sunday 1230, that defective crystal put them on 9722.5; 6150 was on from Cahuita briefly until a \$10K tube blew; 40-kW multi-frequency unit was being disassembled and moved to Cahuita (*W.O.R.*)

Radio for Peace International invites T-shirt orders, inquiries to U.S. toll-free number 1-800-283-0991. *Mailbag*, following some *World of Radios* Tuesday, Friday, Saturday, has been including receiver reviews; said 7375 antenna is 2-element yagi, 13630 4-element, 15030 3-element, 21465 a wire-beam 8-element fixed at 10 degrees, but not heard lately with declining MUF, and best day and night on 13630-USB, which once had U.S. 2-way interference from KEMA0 contacting KCP63. *W.O.R.* sked is Sun. 2300, Mon. 0700, Tue. 1900, Wed. 0300, Fri. 2000, Sat. 0400, 1800, Sun. 0200, taking off-air feeds minimizing delays; also often found in 1000-1300 period at varying times the morning after (gh) *Vietnam Veterans Radio Network* anti-war reminiscences and music, will be on RFPI for at least 3 months (Jim Hale, AR)

CROATIA There are no doubts in Europe that Zagreb transmissions come from Croatia itself. SW transmitters are manufactured in Zagreb by a company called RIZ, Box 654 (Dave Kenny, British DX Club) Theme music on the 21480 broadcast weekends at 1203 in English is the same as on the WHRI 7315 relay, which is normally different from that on 9830 (Bob Colyard, NJ, *SPEEDX*) Croatian Radio, Zagreb, announced it was adding another broadcast to the Americas, no details (BBCM) New is 13640 including English at 2103 (Eugene, BRT *Radio World*) 9830 is



Shortwave Broadcasting

a bit ahead of 7240 and 21480—different site? (Wolfgang Bueschel, Germany)

CUBA RHC's SSB—no carrier tests started in late June on 13660 in the 0000-0430 period though rated 30 kW, it was weaker here than RFPI on 13630 (gh, OK)

ECUADOR Technical standards at HCJB are abysmal; transmitters off frequency, and up to 15 spurs on some bands, such as 15125 blocking AWR Russia at 0430 (Ernie Behr, Ont.) *Dateline 90* on August 31 plans listener comments and rebuttals (HCJB) Radio Centro, Ambato, 3290 has live program of Indian music, greeting listeners worldwide Saturday nights, UTC Sundays (Ken MacHarg, HCJB *DX Partyline*)

EGYPT Cairo was using 11470 mistakenly for its own programming two days in April at 1300 and 1500; Iran's Flag of Freedom Radio is normally here (Rumen Pankov, Bulgaria, *Australian DX News*) IFOF on 11470 in mid-June opening at 0328 with IDs including English, //9250, 15565 (Brian Alexander, PA, W.O.R.)

HONDURAS HRJA, Radio Copan Internacional, tested 15676 around 1800-2200 (Marcel Rommerts RNMN) Later was on at 1400-1600 with 60 watts, fair signal in Miami, up to 1 kW very soon (Kiko Espinosa, Radio Miami Internacional) No trace here, but geostormy (gh, OK)

HUNGARY Budapest is on 15220 in English at 0200 (Norman Blakely, Ont., W.O.R.) Except Sundays—UTC Mondays? when 6110 is still on schedule, always //11910, 9835 (via John Carson, OK)

INDONESIA VOI on about 11752 for English until 0200 and at 0800-0855, announced as on 11755 and 11785, no sign of the latter; strong and steady until 0855 BBC on 11750, Japanese 11755 (David Norcross, Guam)


IRAN New SW site costing 1.2 gigarials in Mashhad has been inaugurated, with four 500-W transmitters radiating 1600kW (Iranian TV via BBCM)

IRAQ RII much weaker but clearer on 15050, new or spur? than interfered 15150, 17739.9 including anti-American English talk at 0041-0053; more English on 15340 at 0240-0251 (Brian Alexander, PA) English at 1300-1600 on 15250v to Europe/Mideast; later announced as for East Asia (BBCM) Only an hour in English at 1430 on new 15240 (Victor Goonetilleke, Sri Lanka, RNMN) 15525 at 0800-1700 is Radio Due (BRT via Wolfgang Bueschel)

ITALY RAI Radio Uno moved to 15525 before or after 1700, ex-15485/9825 (British DX Club)

IVORY COTE Africa No. 1, Gabon has signed an agreement to use part of the time on the 500-kW Akouedo shortwave transmitter built in 1986 (AFP via BBCM)

JAPAN Radio Japan's new relay via Skelton, England, has English at 0500-0600 on 9695, 9770; 0700-0800 on 9670, 9770; 2300-2400 on 6025, 6160; Gabon relay adds 15355 at 1500-1600, moves 11735 from 2300 to 2100-2200 (*Media Roundup*) M.R. on Sundays at 1530, 2130, 2330, even harder to hear now in eastern North America (W.O.R.) RJ plans to expand hours to North America next April (Kyodo via BBCM) RJ has the first and only DX program in Swahili, the last Saturday of every month in the 1715-1745 broadcast on 7180 Gabon, 9535 direct (RJ News via Frank Orcutt)

KBS  **KOREA SOUTH** R. Korea moved one broadcast to us half an hour later, 0030-0130 on 15575 (via Bill Matthews, OH)

KURDISTAN (non?) V. of Kurdistan Revolution, 6761 announced as 6700, had English at 1530-1540 announcing it would repeat at 0330 (BBCM) V. of Iraqi Kurdistan, 4175 includes English ID in the 1500-1955 broadcast, slightly jammed and site must be Turkey as audible in daytime, mailing address in Ankara (Rumen Pankov, Bulgaria, *ADXN*)

KUWAIT RK just sent 1992 schedule: Main Arabic program at 0400-1305 on 6055, 0300-0700 on 15345, 0715-1305 on 15495, 1315-

1745 on 11990 and 21675, 1800-2300 on 15505; English at 1800-2100 on 13620 (via Kevin Klein and Steven Cline!)

LIBERIA ELBC, 7275, from 0652 to 0715 in English, opening, preview, 0657 prayer, 0700 fire & brimstone preacher (Brian Alexander, PA) Surprised to get QSL from this one after follow-up last September via Radio Nigeria; Noah A. Bordolo at ELBC, Box 594, Monrovia sent full-data QSL, long letter, in reply direct by air, so embargo lifted? (Jerry Berg, MA, *Fine Tuning*)

LITHUANIA R. Centras, 9710.08, last Saturday of the month, with English at 0601-0637 including request for reports, brief Spanish announcement (Brian Alexander, PA) see MOLDOVA.

MADAGASCAR RM inactive on 3288 but on 3231.7 and 5009.4 at 0300-0500 when they switch to 6135.5 and 9689.6 (Vashek Korzinek, RSA, via Monferini, W.O.R.)

MOLDOVA (non?) Radio Vilnius said its 15485 relay was from Grigoriopol, seized by separatists so it might not continue (BBCM) Only heard Moscow on that (Greg Jordan, SW Echo via Kirk Baxter) Usual ex-Soviet confusion (Andy Sennitt, *ibid.*)

MONGOLIA RUB's English at 1940-2010 is daily on 11850, 11790 for Europe (Anatoli Klepov, Russia, WDXC *Contact*) Home service measured on some varying frequencies, 4866.7 at 1200; 4893.5 at 1207; 4910.9 at 1300; 4932.6 at 1145 (Tsutomu Kito, Japan, *ADXN*)

MOZAMBIQUE Maputo on 4929.3 at 0530-0600; 6111.0 and 7109.9 from 0600; irregular on 3210, inactive on others (Vashek Korzinek, RSA, via Monferini, W.O.R.)

NEW ZEALAND RNZI moved sign-off up from 1207 to 1130 after BBC relay, on 9700, due to drought, hydroelectric power shortage (Adrian Sainsbury, RNZI, RNMN)

NIGER Another widely-reported harmonic is La Voix du Sahel, Niamey on 50079.5, seven times 7155 (Sheldon Remington, NI6E, Hawaii)

PAPUA NEW GUINEA R. Eastern Highlands, 3395, had lots of election items mid-June around 1030 (David Norcross, GU) Radio Gulf, 3245, and Radio Central, 3290, were shut down for health reasons—no running water or air conditioning (*PNG Post Courier*, via Gordon Darling, NU via DX Ontario)

PERU Three OOB stations were unusually good June 3: R. Ondas del Mayo, 6803.3 until 0200; R. La Merced, 6754.6, at 0120 but not 0150; R. Satellite, 6724.3, IDs at 0215, 0220 (David A. Gasque, SC) R. Nacional had been running TV ads that it would soon be on SW 6015, but not heard

yet (Pedro F. Arrunategui, Lima, via Monferini) New station is Radio Santa Fe, Urubamba, Cuzco, on 6207v at 2053, 6205.8 at 1258, and until 2000; next day until 2358 on 6428.8v-6425, and at 1244, but by 2245 closing that day back to 6205.8. R. San Antonio, Bambamarca, 5569v-5567 required

FM-slope detection at 2358; a few days later until 0201 on 5605. R. San



DX Listening Digest

— Much more info in the style of Hauser's column.

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Shortwave Broadcasting

Mateo, Contumaza, on 4495.02 very good at 0050-0100. New, too, is R. Landa, 6033.09, Arequipa, at 2250, 5th station there on 49m (Juan Carlos Codina(C), Peru via Monferini, W.O.R.) Radio El Sol, 5969.75, at 1146 had 3-note chime, address, and program called *La Voz del Peru* (Rich McVicar, Ecuador, DXPL)

PHILIPPINES R. Pilipinas, 21560, 17840 and 17760 all good at 0250 with *ASEAN Connexion* featuring music from Malaysia, 0300 Pres. Aquino speech in Engalog (David Norcross, GU)

POLAND Brown Boveri contracted to deliver a 250 kW SW transmitter, but not certain Polish Radio Warsaw will get to use it (PRW via BBCM)

PORTUGAL AWR closed down its Sines relay at the end of June (Bill Matthews, R Korea) Finn Krone's DX Report will not be continued via Italy or Russia (RNMN) Typo last month: 17595, not 17495.

RUSSIA Christian Radio Station Alpha & Omega, from the Protestant Publishing House in Moscow, is in Russian at 1400-1500 on 9865, just before Radio Radonezh, Orthodox (BBCM)

AWR, Russia, added 200 kW transmitters at three sites to Europe: Moscow 0230-0300 on 11785, 0600-0630 on 11775, 1400-1600 on 9775; Yekaterinburg ("Ekaterinoburg") 0300-0330 on 11785, 0330-0430 11900, 1800-2000 7310; Samara 0430-0530 15125, 0530-0600 12010; 1600-1800 15125 (via Wendel Craighead, KS, W.O.R.)

R. Galaxy on 11880 ex-9880 at 1900-2200, some English; PO Box 7, Moscow 117418 (S. Aoki and T. Kondo, Japan, RNMN)

R. Moscow asks: What do you think of our newscasts? in a seven page questionnaire. Write to Audience Research Service, Radio Moscow, 25 Pyatnitskaya, Moscow (via John Carson, OK)

R. Novaya Volna, 17760, quite good at 1600-1659 in English and Russian (Rich McVicar, HCJB DXPL)

Omu Shinri Kyo, Japanese religious sect broadcasts via R. Moscow, prompted complaints from RM's Japanese audience. RM said it would not share its radio waves and air time with OSK (BBCM) Name given in June was an egregious howler, a bizarre latinization of Greek and Japanese; should be *Evangelion tis Vasilias*, meaning Gospel of the Lord (Richard Wood, HI) Replaced 15315 with 17710 for Japanese at 1300 after Moscow Korean (Mick Ogrizek, ADXN) Added English broadcast in Japanese accent via RMSW!—2030-2058 on 15355, 15375, 15500 (Bill Westenhaver, PQ, W.O.R.) Daily, also at 0430, on 40+ frequencies each! (T. Kondo and S. Aoki, Japan, RNMN and RJMR) Called *Message of the Holy Heaven* (N. Takahashi, S. Aoki, T. Yamashita, RJMR)

R. Pamyat, 12060, sent form letter QSL for taped report in 3 months, signed by Yuri Mirolukov; said sked is 2200-2300 on 50 kW 6145 from Yekaterinburg; 1330-1500 on 200 kW 12020 Yek., 1500-1800 on 20 kW 11665 Moscow (Jerry Berg, MA, FT)

R. Radonezh, from Orthodox church, changed to 12050 at 1130-1330 for Siberia, 9865 at 1500-1700 to European Russia, Ukraine (BBCM)

R. Shark, Ufa, Bashkortostan, in Russian on 5780 at 0200-1900 except Sundays from 0600 (BBCM) It's R. Shakh, new independent station, 0120-0305 on 5780, non-stop disco/dance music (Martin Reynolds, WDXC Contact) It's R. Sharp, 0300-1900 daily (Anatoly Klepov, DX Moscow via Play-DX) No, it is R. Shark, heard at 1500-1900 (Y. Kato and S. Aoki, RJMR)

Stellar is a new music program on R. Yunost, Moscow, Tuesdays 1720-1800 (Tangerine Wave via Bruce Atchison) Heard on 15150, electronic music; a piece of mine, *Hay River* is on their playlist (Atchison, VE6XTC)

R. Station Pacific Ocean (*Tikhiy Okean*), has news in English Saturdays 0750-0753 on 21505, 21485, 17860, 17850, 17695, 17590, 15425, 15415, 13645, 13605, 12070, 12050, 11915, 11815, 10344=USB, 9905=USB, 9820, 9780, 9670, 9600, 9630, 7210, 245 (BBCM)

Radiotrak (not trek), Yekaterinburg, is daily at 1600-1800 on 20 kW 6910, music and ads Box 932 (Stanislav Mekhonoshin, Perm')

R. Vedo, Volgograd, runs 1400-1800 Monday-Friday on 7185, 9655, 11760, 13710, in Russian, English and German (Y. Kato, RJMR)

SAINT HELENA Swedish DXers John Ekwall and Jan Tuner visited here, persuaded R. St. Helena to start regular broadcasting on 11092 this "fall" (*Eter Aktuell* via Usenet via Mike Agner, SW Echo via Agner, Larry Nebron, Kirk Baxter)

SERBIA R. Serbia, 7200, had English news at 2030 in early May (Julian Southern and Edward Southwell, WDXC Contact) R. Yugoslavia is on 7200 only, English at 1930-2000, 2100-2130 (BRTN Teletext via RNMN) R. Yugoslavia missing from Bijeljina frequencies since late June (Bill Westenhaver, PQ) Lost access June 15 (ORF via Wolfgang Bueschel)

SHRI LANKA is new Anglicized spelling announced by government (CARF via DXPL) TWR will use former 12.5 kW jammer for SW broadcasts from September; later own 100 kW (Victor Goonetilleke, RNMN) Why not re-spell it CEYLON?

SLOVAKIA If split from Czecho, some R. Czechoslovakia SW transmitters are already in this portion (W.O.R.) V. of Free Slovakia (Hlas Slobodneho Slovenska) heard already in April on 7060 at 1600-1630 (Jiri Karas, Prelouc, Play-DX)

SOUTH AFRICA Capital R., Transkei, inactive on 75m, but very good on 7149.5, often blocking Lobito (Vashek Korzinek, RSA, via Monferini, W.O.R.)

SUDAN R. Omdurman has a new external frequency at 1000-2300 (*Al-Wafd* via BBCM) 7200 heard at 1757-1830, asking for reports (Andy Sennitt, RNMN) Opposition's R. SPLA on new 11200, 1300-1400 in English, Arabic, not on 11710, 9550 (BBCM)

SURINAME QSL letter from R. Apintie, 5006, says 50 watts, hoped to have 350-watt Henry Radio linear working again soon (Richard A. D'Angelo, PA, W.O.R.)

TAJIKISTAN Dushanbe's external frequency 7245 also carries independent commercial R. Payk-i 'Ajam-Persian Messenger, at 0500-1500 (BBCM)

UAE Dubai replaced 15435 with 17890 at 0300 (via Gigi Lytle, TX)

UGANDA R. Uganda director told me reactivating 15325 will take another two years (Greg Jordan, SW Echo via Kirk Baxter)

UKOGBANI BBC Olympic coverage includes *Sportsworld* daily at 2009-2030; *Barcelona Beat* on 15070 at 1700-2030 July 31-August 9. *Prom Concerts* at 1830 various days of week live through mid-September, such as July 30. New Ukrainian service is 1800-1830 on 11760, 9635, 6060 (*London Calling*)

USA *World of Radio* revised sked on WRNO: Saturday 2200 on 15420, UTC Sunday 0200 on 7355, 2030 on 15420; WWCN, Friday 2115, Sunday 1000, Monday 2045 on 15690, Sunday 0305 on 7435; see also COSTA RICA. WWCN has filed for new 13595. WEWN, testing soon, authorized to trailblaze new band on 18930 (gh) WJCR planned to put 2nd transmitter on 7460 to South America (Ken MacHarg, HCJB DXPL) Monitoring from Alabama confirms Cuban programs on WHRI 9495 are being jammed (Tim Hendel) Wipes them out in Oklahoma; asks RHC's Arnie Coro to QSL (gh) RMI's Haitian clandestine is spelt in Creole R. 16 *Desarm*, M-F 2100-2300 on 17835 via WHRI (Jeff White) WFLA, 970, Tampa, heard at 1125-1245 on 25870 (Rufus Jordan, PA, W.O.R.) SWL net Sundays 1400 on 7240 LSB, led by KW3F (Ed Henderson, SC)

UZBEKISTAN R. Tashkent on new 17815 at 1200 and 1330 in English (BBCM)

VANUATU 3945 in Bislama, English from 0835 'til buried by Japan 0923 (David Norcross, GU)

ZAIRE R. Lubumbashi, 7203.2 only, regular at 0400-0500, 1700 (Vashek Korzinek, RSA, via Dario Monferini, W.O.R.)

Broadcast Loggings

*Thanks to our contributors — Have you sent in YOUR logs?
Send to Gayle Van Horn, c/o Monitoring Times.
English broadcast unless otherwise noted.*

0015 UTC on 4810.2

SOUTH AFRICA: Radio Suid Afrika. Afrikaans/English. American pop music tunes played to 0025 UTC. English ID and chat to Radio Five ID at 0100 UTC. (David Gasque, Orangeburg, SC) Radio Orion heard on 3320 kHz at 0340 UTC. English/Afrikaans programming, with music pops and local news. (W.L. Witt, San Antonio, TX)

0030 UTC on 9530

SPAIN: Spanish Nat'l Radio. "Window on Spain" program discussing religion in Spain. (Bob Fraser, Cohasset, MA) (David Hiipakka, Rota, Spain)

0034 UTC on 7415 USB

PIRATE: W.A.R.I. ID noted as, "Alternative Radio Int'l" repeated numerous times. QSL addresses announced, weather report, and DJ chat. Station ID, address, and sign-off at 0103 UTC. (Nicholas P. Adams, Port Murray, NJ)

0035 UTC on 17740

IRAQ: Radio Iraq International. English/Arabic. Station noted with Arabic ID as, "Itha'Al-Iraq Al-Dolia." English IDs and political commentary to Arabic service. Monitored on 15150/15340 parallels. Similar programming monitored at 0100 UTC on 15340 kHz. (Stephen J. Price, Conemaugh, PA) (Hiipakka, Spain) Station noted on 15050 kHz at 0010 UTC on 15209.9/17740 kHz in Arabic. (Ed)

0045 UTC on 4435.1

BOLIVIA: La Voz de Tropico. Spanish. Great night for South American DXing. Easy-listening and Spanish pop vocals. Clear station ID at 0100 UTC. Bolivia's Radio Santa Cruz heard in Spanish on 6135 kHz at 1015-1026 UTC. IDs, language skills lesson, and Latin music monitored. (Gasque, SC)

0100 UTC on 4795.3

ECUADOR: Radio Caras. Spanish. Mostly talk and public service announcements. Station ID/promotionals and local interest items. Monitored to 0130 UTC. (Gasque, SC)

0105 UTC on 11800

ITALY: RAI. Report on stabilizing the Leaning Tower of Pisa with lead counterweights. Additional monitoring on this frequency at 2200 UTC. (Fraser, MA) (Hiipakka, Spain)

0145 UTC on 4890.4

PERU: Radio Chota. Spanish. Peruvian huayos music at tune-in. Fair signal quality for audible ID. Brief announcer comments. Monitored just past 0200 UTC, with additional echo effect ID mentioning Chota. Several local time-checks and campo music. Additional Peruvian, Radio Inca heard on 4237 kHz at 1025 UTC. DJ talk, quick ID and music. (Bob Livingston, Miami, FL)

0220 UTC on 7651 USB

UNITED STATES: VOA. Lady presents, "VOA Wednesday Morning" show. Programming in Indian dialect heard on LSB at 0220 UTC. (Gasque, SC)

0225 UTC on 4679.5

ECUADOR: Radio Nacional Espejo. Spanish. Radio drama in progress at tune-in until 0229 UTC. Station ID as "Radio Nacional," and noted mentions of Quito and Espejo. Radio drama continued at 0231 UTC. Ecuador's Radio Progreso heard on 5061.8 kHz at 0230 UTC. Station IDs and promotionals included. (Gasque, SC)

0233 UTC on 21580

PHILIPPINES: Radyo Pilipinas. Special program on a composer from Dares-Salaam, featuring several of his musical works. (Dave Frenz, Milwaukee, WI)

0310 UTC on 14950 USB

RUSSIA: Radio Raqui. Russian. Tune-in to program featuring interview with local musician and brief music bits to 0339 UTC. Station ID noted as, "Ra-Key," followed by easy-listening music after 0345. Time pips signal at 0400 and newscast with fading signal. (Gasque, SC)

0325 UTC on 15185

FINLAND: Radio Finland. Station interval signal, and multilingual IDs. English news and comments. (Nick Terrence, Huntington, NY)

0330 UTC on 17770

NEW ZEALAND: Radio New Zealand Int'l. Play-by-play rugby action. Half-time commercials, ID, and sports talk. (Robert E. Tucker, Savannah, GA) Interviews and talk on New Zealand's Armed Forces heard on 9770 kHz at 0950 UTC. (Fraser, MA) (Livingston, FL)

0359 UTC on 15060

SAUDI ARABIA: BSKSA. Arabic. Interval signal at 0359 and time pips signal. Station ID at 0400, followed by Holy Koran recitations to 0411 UTC. Mostly announcer talk afterwards. (Gasque, SC)

0407 UTC on 3380.6

MALAWI: Malawi Broadcasting Corp. Chichewa/English. MBC "Morning Show" with ads, and public service announcements in English. African style music, local chat, and ID to fade-out at 0430 UTC. (Frenz, WI)

0416 UTC on 15220

TURKEY: Voice of Turkey. Talk on Turkey into Turkish folk music. (Tucker, GA) Report on new books translated in Turkish, heard on 9445 kHz at 2230 UTC. (Fraser, MA) (Hiipakka, Spain) (Witt, TX)

0419 UTC on 15160

BULGARIA: Radio Sofia. News and national commentary. (Tucker, GA) Report on the role of Bulgarian radio in the new Europe heard on 11720 kHz at 2200 UTC. (Fraser, MA) (Sam Wright, Biloxi, MS)

0430 UTC on 5033.7

CENTRAL AFRICAN REPUBLIC: RTV Centralafricane. Tentative station ID at 0430. Local dialect into music. Announcer chat and rooster crowing sound effects in background. Abrupt sign-off at 0450 UTC. (Gasque, SC)

0435 UTC on 15070

FRENCH POLYNESIA: RFO-Tahiti. Tahitian/French. Evening programming heard also on parallel 11825 kHz, with multilingual chat, ID, and local items. Polynesian vocals and instrumentals. (Tucker, GA)

0532 on 4870

BENIN: ORTV-Du Benin. French. Regional news, and talk to brief African rhythms. (Frenz, WI) Station fade-in around 2210 UTC with fair to poor signal quality. French radio soap opera, to western music tunes. Sign-off routine and ID at 2300 UTC. (Fraser, MA)

0534 UTC on 17795

AUSTRALIA: Radio Australia. Discussion on fiber optic cables, followed by the debate of the Aussie press freedoms. Additional monitoring on 21740 kHz at 0544 UTC, and 13755 kHz at 1355 UTC. (Tucker, GA)

0600 UTC on 11954.9

ANGOLA: Radio Nacional. Portuguese. "Nacional" ID at tune-in. Lady announcer reads world news and ID repeat. American pops to African style rhythms. Parallel monitoring on 9720.21 kHz. Additional monitoring on 4950.8 kHz at 0200 UTC. (Livingston, FL)

0710 UTC on 7275

LIBERIA: ELBC. News in progress at tune-in. Station ID at 0714, followed by international news. News in local dialect 0718-0722. "Drums" interval signal played between programming portions. Local native music show after ID at 0730 UTC. (Gasque, SC)

0810 UTC on 6090

BRAZIL: Radio Bandeirantes. Portuguese. Typical Brazilian "Morning Show," with animal sound effects, jingles, and promos. Two male DJs with plenty of laughs and chat. Canned IDs, time checks, Brazilian pops included. Monitored to 0830 UTC. (Ed)

0938 UTC on 4790

PERU: Radio Atlantida. Spanish. Peruvian music with male DJ. Morning show program format and "Atlantida" ID. Rooster sound effects and chat with signal fade-out by 0954 UTC. (Terrence, NY)

1048 UTC on 3235

PAPUA NEW GUINEA: (New Britain) Radio West New Britain. Pidgin/English. Multilingual talk and local news items. English ID as, "Radio West" at 1055 UTC. Pidgin news at 1100 UTC. (Ed)

1515 UTC on 9515

CANADA: BBC World Service Relay. "Concert Hall." "Seeing Stars" show conducts a visit to the Canary Islands' Observatory, heard on 9590 kHz at 2215 UTC. (Fraser, MA)

1758 UTC on 15505

KUWAIT: Radio Kuwait. Arabic. Station sign-on to ID at 1800 UTC. Music vocals, IDs and "Hello Kuwait" telephone interview program. Instrumental music selections to tune-out at 1832 UTC. (Adams, NJ) English service monitored on 13620 kHz at 2042 UTC. Music, IDs, and national news to sign-off at 2059 UTC. (Tucker, GA)

1950 UTC on 13855

ICELAND: Icelandic Nat'l Broadcasting Service. Icelandic/English. Parallel programming monitored on 15770 kHz, with multilingual talk, and references to USA Today newspaper. (Terrence, NY)

2045 UTC on 6005

CANADA: CFCX. Live baseball coverage broadcast, New York Expos vs the Pittsburgh Pirates. (Fraser, MA)

2107 UTC on 21655

PORTUGAL: Radio Portugal. Portuguese. Station ID breaks during soccer game commentary. Monitored on parallel freqs 15250/1740 kHz. (Terrence, NY) (Wright, MS) (Livingston, FL)

2200 UTC on 7490

USA: WJCR. "The Voice of the World." Popular music classics and contemporary Christian tunes. Station ID and promotionals. (Adams, NJ)

2304 UTC on 7415 USB

PIRATE: WCYC. Station ID "WCYC Free Radio." QSL address, and chat. Rock music and CD phone-in contest promo. (Adams, NJ)

2320 UTC on 11965

UNITED ARAB EMIRATES: Radio UAE. Arabic. Readings from the Holy Koran, heard also on parallel 13605 kHz. (Fraser, MA) (Hiipakka, Spain) (Wright, MS)

2340 UTC on 7415 USB

PIRATE: WGOP. Station ID as "WGOP Conservative Radio." Rock music tunes to chat on Popular Communications and ACE publications. Station closing transmission at 2347 UTC. (Adams, NJ)

2328 UTC on 5047

TOGO: RDTV-Togolaise. French. African rhythms to DJ's ID and local interest news items. Mentions of city Lome' and additional music. Closing station ID to national Togolaise hymn at 0003 UTC. (Terrence, NY) (Livingston, FL)

Utility World

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Basic Utilities

The 1991 MT convention at Knoxville seems like only yesterday, but my memories of it will probably live forever. Meeting all those nice folks and having a chance to share information was the best part. Of course, renewing friendships and meeting new MT staffers is always a lot of fun, too.

During the last convention, I had the chance to meet Grove's new general manager, Kelly Davis, for the first time. I even had the honor of having Kelly sit in on a couple of my forums. Boy, talk about getting nervous in a hurry.

Right before the forum started, Kelly walked up and asked me, "What is utility monitoring?"

"It is probably one of the most fascinating hobbies on earth," I began. As I saw his eyes go to the ceiling of the forum room, I could see he had heard that one before.

"No, really Kelly. It is!"

Kelly said, "Fine, Larry, but what is this utility stuff all about?" I could see that he really wanted to know, but this forum with two hundred utility buffs wasn't going to give him the full answer to his question. So, this column is for you, Kelly, and all you newcomers out there: a basic introduction to utility monitoring.

Utility monitoring is the real world in its everyday existence, peaceful or harried. It can be as mundane as an aviation weather broadcast, or as exciting as an open sea search and rescue. Utility comms are primarily the conducting of private or official business. In the HF spectrum from 1.6 to 30 MHz, throw out the shortwave broadcast bands and everything else is considered a utility frequency. Traditionally, the amateur radio and citizen's bands have also been excluded from this definition of "utilities."

With a turn of the dial you might hear Aunt Mabel on the *Love Boat* talking to Aunt Jane in Kansas. The eight marine bands worldwide are always hopping with ship-to-shore, ship-to-ship, and shore-to-ship traffic 24 hours a day in a variety of transmission modes.

Tune around some more and you will might hear airliners flying the world's air routes reporting weather and their positions to radio operators on the ground. In the aeronautical bands you will also hear aviation weather broadcast from stations all around the world and even private airline company traffic. But the air traffic control chatter is what people want to hear the most. These communications can be heard along routes from Europe, Middle East, Africa, Indian Ocean, Pacific, Asia, Atlantic, South and North America using Upper Side Band (USB) mode and in English. Within these bands are also the Flight Test frequencies. Most of us were thrilled to listen to the flight of the *Voyager* aircraft several years ago and these communications were heard on flight test channels in the HF aero bands.

There is plenty of mystery and intrigue in the utility bands. On other frequencies you might enter the strange world of number stations, in one of several languages. This mystery hasn't been solved in over 30 years and search for their true purpose still haunts many listeners even today.

Tune around some more and you'll come across military tactical communications from not only from all branches of our own military, but from military organizations worldwide. You will hear all sorts of colorful callsigns associated with these stations such as Aardvark, Eight Ball, Charlie 8 Lima calling Whiskey 2 Kilo. Imagine hearing Fireball calling Go-cart or Devil 26 working Outhouse. The range of calls are both creative and fun to listen to.

Tune anywhere in the HF spectrum and you will find the United States government well represented. Agencies like FEMA (Federal Emergency Management Agency), NRC (Nuclear Regulatory Commission), FHA (Federal Highway Administration), DOT (Department of Transportation), DOE (Department of Energy), Department of State (including embassies), several Alaskan state agencies, FCC (Federal Communications Commission), Department of Commerce (including NOAA and the hurricane hunters), TVA (Tennessee Valley Authority), FBI (Federal Bureau of Investigation), and Customs/ DEA (Drug Enforcement Agency) all can be heard from time to time using voice comms.

Other governments and agencies worldwide also use HF to communicate. One of the more interesting is INTERPOL (International Criminal Police Organization). If you have a data mode demodulator, you can watch warrants and information on criminals wanted by various governments being passed to other governments via these networks.

Other international agencies well represented in the utility bands are the International Red Cross (and Red Crescent), Spanish and Zaire National Police, World Relief and various Christian Missions, United Nations, and Caribbean hurricane emergency networks, to name just a few.

As I mentioned before, the utility bands handle business-type communications. There is no shortage of commercial communications in these HF bands. Unless the political situation has disrupted it, the Firestone Rubber company has a net to talk to their associates in Harbel, Liberia. Petroleum companies and their support personnel can be heard all over the place. This stuff can get real interesting when hurricanes threaten in the Gulf of Mexico.

Bell Telephone has extensive networks in case of emergencies and they can be heard testing those networks from time to time. There are all sorts of business traffic experimental stations, and common carriers (telephone comms) that can be heard as well.

Do you need to know the exact time? Well, there is a whole group of stations in the utility bands devoted to providing you with the time of day. These stations use atomic standards so the accuracy is the best in the world. Stations from the United States, Australia, Canada, Czechoslovakia, Ecuador, and Venezuela, to name a few, can be heard transmitting time 24 hours a day.

If space is your bag, you can listen to the comings and going of NASA space shuttle tracking networks, shuttle air to ground comms, ESA (European Space Agency) launches, military missile test ranges and even spacecraft in orbit. From time to time listeners in Europe still report signals from Russian manned and unmanned spacecraft on HF frequencies around 18 and 20 MHz.

Getting Bleeped

You will also hear a wide variety of non-voice signals on the utility bands. All sorts of groans, whistles, beeps, blurbs and buzzes. Signals in the non-voice modes come in many shapes and sizes.

Signals from space aren't limited to spacecraft. You can hear Jupiter, meteors, even our sun puts out noise in the HF spectrum. Other non-voice signals you might hear include: over-the-horizon radars (known as woodpeckers), sweepers, water drippers, foghorns, key clicks, scrambled communications, and thunderstorms. Now, I want to warn you that monitoring during a thunderstorm can get you and your equipment in trouble. You especially shouldn't be monitoring if the time between the thunder and a lightning flash is but a few seconds apart. You are begging

for trouble.

You will encounter other noises on HF as well. They might include: your neighbor's fluorescent lights, light dimmer panels, fish tanks, TV sets, power tools, air conditioners (most motor driven appliances), auto ignitions, thermostats, and outside power lines.

Most of these noises aren't true communications; so how about non-voice signals that you can decipher? Via radio teletype (RTTY), you can receive news services straight from the source. They broadcast the latest news, sports and commentary. Other RTTY-type modes that can now be monitored on the shortwave bands is a study in itself. I hope those of you interested in data modes get a chance to go to Fred Osterman's forum at *MT* Atlanta 1992. It will be well worth your time.

The newer multi-mode data terminals such as Universal's M-7000 can demodulate most of these modes. Baudot or standard RTTY signals are transmitted in standard/non-standard speeds and bit inversion. ASCII (low and high speeds) is found sparingly on HF. SITOR-A/B can be found in abundance in the maritime bands. Maritime stations throughout the world have adopted SITOR-B as a standard for their NAVTEX service on 518 kHz. Military stations use many modes: encrypted RTTY, VFT (Voice Frequency Telegraphy formerly called Frequency Division Multiplex), and several ARQ modes—Moore Time Division Multiplex modes 2 and 4, ARQ-E/E3/S.

Some of the ARQ modes have been developed for use by certain countries and their governments. These would include: CAN-ARQ (Canada), DUP-ARQ (Hungary), GDR-DUP (Old East Germany), Swedish-ARQ, and SI-ARQ/FEC. There are even more exotic SITOR-B type modes such as FEC-A and FEC-8. One mode that seems to have disappeared is Autospec—or has it?

There are the musical modes used by French and British diplomatic services called Coquelet and MSFK (more commonly known as Piccolo). These codes have recently been broken by *MT*'s "RTTY" columnist Jack Albert and Dave Wilson. A special third or fourth shift mode enables non-Roman alphabets such as Russian, Greek, Japanese, etc., to be transmitted via RTTY.

Another mode that is gaining in popularity is facsimile; "fax" for short. This mode is used to transmit pictures (yep, just like that office fax), weather maps and weather satellite pictures. Computers have really helped this mode gain favor with hobbyists, as you can see in this month's feature article.

The newest mode experiencing tremendous growth on HF is packet radio. Right now pirate stations and MARS stations are the primary users.

If you have a fondness for Morse Code or CW, the number of CW stations in the utility bands is almost endless. While other services are trying to rid themselves of this mode, CW still flourishes in abundance in the utility bands. Morse code signals bridge a variety of services including the mysterious single letter HF beacons. These signals have been around since the late 60's or early 70's and we still don't know their purpose for sure.

Unclassified

There are the bizarre and unknown stations in the HF spectrum. Fishing fleets can be found just about anywhere with their X-rated language. These guys add new meaning to the saying, "Cussing like a sailor." Pirate radio broadcasters, cordless telephones, terrorist networks, drug smugglers, unidentified Morse code traffic, and the aforementioned numbers stations and single letter HF beacons are just some of the stations you will hear in this category. And yes, there are the "we really don't know what those noises are" transmissions. Maybe you will be the one to solve the mystery, but you have to give it a whirl (or is that, "twirl") of the dial first.

The variety and diversity of utility communications and their stations are seemingly endless. *Seventy-five percent of all shortwave transmissions are of a utility nature.* So, once you fire up your rig, let your curiosity

and imagination take hold. The arm chair adventure is just beginning.

"Okay, Larry, this is great stuff, but where do I go to get the most bang for my buck?" Well, folks, you might want to give the following hot frequency ranges a try for starters:

2180-2900	4300-4750	5300-5900	6600-6900	7500-8000
8700-9050	11175-11400	13200-13340	15010-15100	

Strategic Command

I don't want to take any thunder away from this month's Federal File column, but I can't let sweeping changes go unmentioned. As you probably already know, the Strategic Air Command is no more. They have merged the Navy's Strategic Missile forces and the old SAC into the new Strategic Command or STRATCOM for short.

As a result, we now have Strategic Command traffic appearing all over the place. As I type this, Offutt is sending an EAM (Emergency Action Message) over selected US Air Force Global Command and Control channels, US Navy HICOM (High Command) channels and over the old SAC primary channels. All these are being keyed simultaneously by one operator at Offutt. Not all channels are used for every broadcast; a lot depends on the activity on those channels.

For instance, the transmission I just heard went as follows: "Mainsail, Mainsail, this is Offutt, Offutt. Message follows..." then into the EAM twice. That was broadcast on the following frequencies: 11243, 6761, 11176, 8993, and 8967. Those were just the ones I remembered to tune in off the top of my head. Now that same operator is bringing up links adjust saying "test, test, test 1-2-3." Hummm, vvvveerrrryyy interesting indeed.

We are exploring some new territory here. Be very vigilant on all the GCCS, Navy, tactical and old SAC channels, and look for parallels during these broadcasts. Especially, watch out for your September issue of *MT* when we will have a special feature on the reorganization of channels and commands. This will be based on official sources, so don't miss it!

AUTOSPEC, is it dead?

Robert Hall, our faithful reporter in South Africa, reminisces about the RTTY mode AUTOSPEC. AUTOSPEC is an emission mode which has reportedly been used by RSA Government agencies but is now said to be no longer in use.

There are no decoders for AUTOSPEC that I know of except, perhaps, by some special EPROM for the Wavecom or Hoka 3. Certainly I have seen no loggings of AUTOSPEC in any publications in recent years and so it seems to be dead! Or is it?

Six months ago I logged Gough Island Meteo (ZOE) on 17102.6 kHz running ARQ-M2 at 96/120, but on the space LED only! The transmission to Pretoria was a bit garbled but some words in Afrikaans were legible. Now in my most recent logs I have noted two more frequencies with precisely similar characteristics: 5586.7 kHz at 0459 and 19196.7 kHz at 1702, both running M.2/96 and tuning to space only. Moreover the emission sounds were exactly similar and again, some brief Afrikaans words came up on the screen.

I am an old-timer in age terms but very young in the DX world. I thought that some of you true old-time DX'ers might be interested in these unusual signals, and the fact that the M-7000 does decode—albeit in a strange way. And, I wonder, could it be AUTOSPEC?

Thanks, Robert, for the report and I am sure we all are tuning in those signals to see what we have on our hands. I want to mention that next month I will preview "Utility World's" involvement in Atlanta 92. I hope to see you all there. Now it is time to see what you are hearing this month in the utilities. Time for a hurricane and your logs...

Utility Loggings

Abbreviations used in this column

AFB	Air Force Base	NDB	Non-directional beacon
AFPMC	Air Force Pacific Missile Center	Ops	Operations
AM	Amplitude Modulation	PAP	Polish Press Agency
AWACS	Airborne Warning and Control System	PIAB	Presse und Informationsamt der Bundesregierung
CG	Coast Guard	QRA	The name of my station is...
CGC	Coast Guard Cutter	RAF	Royal Air Force
Comms	Communications	RTTY	Radioteletype
COMSTA	Communication Station	SAM	Special Air Mission
CP	Command Post	SAR	Search and Rescue
CW	Morse Code	Satcom	Satellite communications
DE	From	SELCAL	Selective calling
FAX	Facsimile	SID	Sport-Informationsdienst
GCCS	Global Command and Control System	SITOR-A	Simplex telex over radio, mode A
		SITOR-B	" " " " mode B
GPS	Global Positioning System	Sked	Schedule
Green comms	Scrambled voice/data	Unid	Unidentified
HF	High Frequency	USAF	United States Air Force
ID	Identification	USB	Upper Side Band
LDCC	Long Distance Operational Control	VFT	Voice Frequency telegraphy
		VOLMET	Airport weather broadcast for aircraft in flight
MARS	Military Affiliate Radio System	USCG	United States Coast Guard
Meteo	Meteorology	USS	United States Ship
MFA	Ministry of Foreign Affairs	XINHUA	New China News Agency
m/v	Motor Vessel		

All frequencies in kilohertz (kHz), all times in UTC. All voice transmissions in English unless otherwise noted.

- 50.0 OMA-Time station, Liblice, Czechoslovakia, at 2300. (Ary Boender-Netherlands)
- 60.0 MSF-Time station, Rugby, England, at 1100. (Boender-Netherlands)
- 68.9 GBY20-Navy, Rugby, England, with coded FSK messages at 0851. (Boender-Neth)
- 70.45 DECCA station (Holland chain) at Thorpeness, England, with carrier at 1300. (Boender-Netherlands)
- 71.43 DECCA station (Frisian Island chain) at Zeven, Germany, with a carrier at 1305. (Boender-Netherlands)
- 75.0 HBG-Time station, Prangins, Switzerland, with time signals at 1130. (Boender-Neth)
- 77.5 DCF77-Time station, Mainflingen, Germany, with time signals at 1133. (Boender-Netherlands)
- 84.55 DECCA station (Holland chain) at Gilze-Rijen, Netherlands, with a carrier at 1536. (Boender-Netherlands)
- 85.72 DECCA station (Frisian Islands chain) at Finsterwolde, Netherlands, with a carrier at 1536. (Boender-Netherlands)
- 100.0 Unid station sending Loran pulses here at 1114. (Boender-Netherlands)
- 112.73 DECCA station (Holland chain) at Heiloo, Netherlands, with a carrier at 1535. (Boender-Netherlands)
- 122.3 OUA23-Danish Navy, Stevns, with V CW marker at 0955. (Boender-Netherlands)
- 123.7 DCF42-PIAB Bonn, Germany, with QRA de DCF42/DGL26L2 RY using SITOR-B at 1345. (Boender-Netherlands)
- 126.62 DECCA station (Holland chain) at Sas Van Gent with a carrier at 1532. (Boender-Netherlands)
- 128.85 DECCA station (Frisian Island chain) at Heiloo with an open carrier at 1530. (Boender-Netherlands)
- 140.3 DCF60-SID Duesseldorf, Germany, with sports news using F7B at 300 baud. (Boender-Germany)
- 147.3 DDH47-Deutsche Wetter Dienst, Germany, with RTTY RY test tape at 1025. (Boender-Netherlands)
- 201.0 APF-Naples, FL, NDB at 2009. (John Springhill-Dowland, FL) *John, welcome aboard, glad to get a few each month-Larry.*
- 332.0 FIS-Fish Hook Key, FL, NDB at 1146. (Springhill-FL)
- 412.0 CBC-Cayman Islands, BWI, NDB at 0322. (Springhill-FL)
- 418.0 GNF-Northforeland Radio, England, with CW traffic list at 0825. (Boender-Netherlands)
- 421.0 PCH-Scheveningen Radio, Netherlands, with CW traffic list at 1055. (Boender-Netherlands)
- 426.0 IZS-Montezuma, GA, NDB at 0420. (Springhill-FL)
- 429.0 OXB-Blaavand Radio, Denmark, with CW traffic list at 1055. (Boender-Neth)
- 439.0 OST-Oostende Radio, Belgium, with CW gale warning at 1720. New service, new frequency. (Boender-Netherlands)

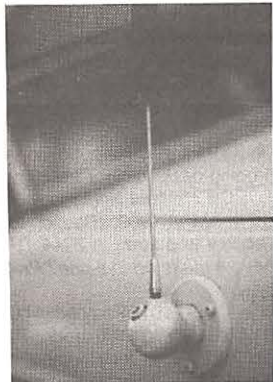
- 441.0 Portishead Radio, England, with test messages at 1411 using SITOR-B. New service, new frequency. (Boender-Netherlands)
- 444.5 PCH-Scheveningen Radio, Netherlands, with CW traffic list at 2045. FFB-Boulogne-Sur-Mer Radio, France, working unid vessel in CW at 1923. DHS-Ruegen Radio, Germany, working unid vessel in CW at 2023. All these stations on a new frequency. (Boender-Netherlands)
- 447.0 OXJ-Thorshavn Radio (Farther), Denmark, with CW weather at 1435. (Boender-Netherlands)
- 468.0 DAN-Norddeich Radio, Germany, working P3KK4 in CW at 2005. New frequency. (Boender-Netherlands)
- 525.0 DAN-Norddeich Radio, Germany, with CW weather at 2000. (Boender-Netherlands)
- 526.0 CYV-Camp Blanding, Stark, FL, NDB at 0326. (Springhill-FL)
- 2670.0 NMB-CG Charleston, SC, with weather and notice to mariners in USB at 0420. NMN70-CG Chincoteague, VA, with notices to mariners and GPS updates in USB at 0240. NMW-CG Astoria, OR, with weather and notices to mariners in USB at 0533. (Ed Rausch-Cedar Grove, NJ) *Welcome aboard, Ed, hope to see you often-Larry.* NMF-USCG Group Boston with non-sked message, "Securite Securite Securite" then cancellation of previous weather warning message at 0104 in USB. (Neal Perdue-AL)
- 2794.0 Canadian Coast Guard Yarmouth, Canada, with ice warnings and coastal off shore weather condition for east Canada ending at 0547 in USB. (Bill Fernandez-MA) *Hummm, Bill I show no listing in my reference for Yarmouth here, interesting-Larry.*
- 4015.0 USAF MARS packet radio network noted here from 1927-2310. (Boender-Neth)
- 4081.0 Two unid station noted here using scramblers in USB at 0610. (Fernandez-MA)
- 4540.0 MLP-RAF Upavon, UK, "Architect" ending a weather broadcast in USB at 0610. (Fernandez-MA)
- 4585.0 Civil Air Patrol (CAP) roll call for Oregon net at 0300. Traffic after 0315 in USB. Oregon uses "Beaverfox ##." At 0400 caught the California CAP wing net and roll call. (David Gervais-College Place, WA)
- 4722.0 MVU-RAF Volmet West Drayton, UK, with aviation weather at 0210 in USB. (Mike Muth-Laplata, MD)
- 4770.0 German female 3/2-digit number station in AM at 0418. (Fernandez-MA)
- 4780.0 Unid CW station heard from 0450 to after 0500. Heard next night around 0318. (James Ingram-Aromas, CA) *James this is a FEMA channel and based on the traffic I would say you have logged the Mt. Weather, Berryville, VA, FEMA station WGY912-Larry.*
- 5499.0 Brazzaville VOLMET, Congo, with aviation weather at 0300 in USB. (Rausch-NJ)
- 5622.0 LZX-Sofia Radio, Bulgaria, working aircraft Lima Echo Hotel at 1724 in USB. (Marshall-Crete)
- 5696.0 CG Rescue 1503 working COMSTA Portsmouth with flight ops. Had only one HF radio in service. Set up primary frequency of 11201.0 for further comms. Initial call from Portsmouth was simulcast on at least 3 frequencies (5696, 8984, 11201) in USB at 1830. (Henry Brown-E. Falmouth, MA) NOF-USCG Air Station Clearwater, FL, working CG aircraft 1482 with a SAR 69 miles offshore in the Gulf of Mexico at 0017 in USB. (Perdue-AL)
- 6235.0 German female 3/2-digit number station in AM at 0855. (Rankin-France)
- 6590.0 Informal comms, sounds like CB with courtesy tones and lots of doubling in LSB at 0925. Also heard them on: 6630.2, 6655.2, 6683.2. (Rankin-France)
- 6693.0 King 1/2, CGC Vigilant, USS Aubrey Fitch working Cape Osborne and DOD Cape with Space Shuttle support traffic between 2137-2340 in USB. (Brian ALEXander-Mechanicsburg, PA)
- 6712.0 AFPMC with reports of launch to Boeing 767 at 0900 in USB. Also heard Cobra Eye, Spy View and French voices with good reports on accuracy. Boeing 767 reports 3 balloons deployed. Also heard stations on 6716.0 and 10214.0. (Scott Beler/Don McLain-Holt, Michigan)
- 6716.0 SAM 86973 working Andrews AFB in USB at 2026. (Alexander-PA)
- 6717.0 SPAR 60 working Andrews AFB in USB at 2234. (Alexander-PA)
- 6728.0 AFA-Andrews AFB, MD, working Air Force 2 in USB at 0151. (Kevin Nauta-Grand Rapids, MI)
- 6978.7 CCS-Santiago Naval Radio, Chile, with 5 figure groups using RTTY at 0715. (Dan Amaniera-Los Angeles, CA)
- 7420.0 Spanish female 4-digit number station in AM at 0300. (Peter Stanwick-Norman, OK)
- 7685.0 RBV85-Moscow Meteo, Russia, with RUMS weather 5-figure/letter groups using 50 baud RTTY. (Marshall-Crete)
- 8297.0 Informal comms heard here by unid Russian stations, not military in USB at 1045. (Rankin-France)
- 8479.0 JCU-Choshi Radio, Japan, with CQ CW marker at 1836. (Marshall-Crete)
- 8743.0 KMI-Dixon (San Francisco) Radio, CA, working m/v American Eagle in USB at 0555. (Rausch-NJ)

8767.0	DAJ-Norddeich Radio, Germany, with "Hier ist Norddeich Radio" ID at 1740 in USB. (Marshall-Crete)	12721.0	SPH-Gydnia Radio, Poland, CQ CW marker at 1543. (Marshall-Crete)
8776.0	B4A/VFS/F5B all working here then into green comms in USB at 0330. (Jeffery Jones-Tracy, CA) <i>US Navy comms-Larry.</i>	12735.0	URL-Sevastopol Radio, Ukraine, with CQ CW marker at 1556. (Marshall-Crete)
8803.0	OHG2-Helsinki Radio, Finland, with phone patch for "UBLD" at 1859 in USB. (Marshall-Crete)	13008.0	JOR with CW marker at 0420. Who? (Anderson-CA) <i>Nagasaki Radio, Japan-Larry.</i>
8828.0	Honolulu VOLMET, HI, at 0134 in USB with west coast weather. (Norman Anderson-Santa Ana, CA)	13015.0	IAR-Rome Radio, Italy, with CQ CW marker at 1625. (Marshall-Crete)
8846.0	Speedbird 38 working New York radio with flight info. 8846 primary and 11396 secondary in USB at 1720. (Todd Koch-Bloomington, IL)	13107.0	WOO-Ocean Gate Radio, NJ, working Majesty of the Seas with phone patch traffic in USB at 1735. Ship was on 12260.0. (Koch-IL)
8894.0	Algiers aeradio working Al Italia 885 with position report and SELCAL check in USB at 0207. (Rausch-NJ)	13201.0	Thule AFB GCCS working MAC 67945 wanting weather into Thule in USB at 0850. (Koch-IL)
8906.0	Martinique 4062 working Santa Maria and New York aeradios at 0045 in USB. (Perdue-AL)	13207.0	Green comms, then Sierra 83 asked India 94 if they were monitoring day and night frequencies. Sierra 83 going back to night frequency secure. (Brown-MA) <i>This is a CANFORCE channel Henry-Larry.</i>
8927.0	Jeddah, Saudi Arabia, working with Saudia 395 at 1705 in USB. (Marshall-Crete)	13375.0	Spanish female 5-digit number station in AM at 1900. (Rausch-NJ)
8964.0	Samworth calling Hickham GCCS with a phone patch to Maleplug at Autovon 684-0100, "Any word on our Echo Alfa Mike? Not as of yet." Samworth then said they were standing by on channel Whiskey Bravo in USB at 0653. (Scott Burke-Tucson, AZ)	13553.0	Unid VFT station sending AP sports scores and news at 2244. (Hal Bilodeau-Des Plaines, IL) <i>Anybody have a make on this one? Probably USN-Larry.</i>
8993.0	Dark Star November (AWACS) working Cobweb. Discussing refueling ops and satcom problems. Noted the following frequencies for future contact 11016.0, 11740.0 and 13670.0 at 1001 in USB. (Brown-MA) <i>Interesting frequencies Henry, great place to hide-Larry.</i>	13775.0	German female 3/2-digit number station in AM at 2101. (Fernandez-MA)
9006.0	Rat 00 calling Rat 02, nothing heard in USB at 1815. (Burke-AZ) <i>This frequency has CANFORCE units, Cape Radio and Andrews here. My guess is CANFORCE-Larry.</i>	13825.0	PACOM 01 working Andrews AFB in USB. at 2230. (Alexander-PA)
9015.0	Unid Spanish speaking station noted at 0059. (Chris Hulse-Eugene, OR)	13857.0	Agua to Luna with 5 figure groups. Heard USB on frequency after packet transmission ended in Spanish at 2256. (Bilodeau-IL)
9030.0	Several unid Spanish speaking stations noted here in USB at 0149. Listened for quite awhile, think it is some sort of aero channel and heard "Salvador Null" mentioned. (Hulse-OR)	14250.0	English female 3/2-digit number station in AM at 2200. Extremely strong signal at 20dB over S9 here in Tome. Wonder if Sandia or Los Alamos are running numbers? (Bob Combs-Tome, NM)
9095.0	English female 3/2-digit number station in AM at 2100. (John Deysher-Towanda, PA)	14251.0	CQ de 0 (zero) 2 times followed by 000000 213700 219840 000000 000000 in CW then entire sequence repeated at 1442. (Rankin-France) <i>You get the most unusual intercept of the month award. Hummm, look at the logging above this one. I wonder-Larry????</i>
9251.0	English female 5-digit number station with British accent in USB no-carrier at 2000. (Rankin-France) <i>I show Sydney/Lord Howe Telecom channel here, but no known English number stations-Larry.</i>	16954.0	GKC-Portishead Radio, UK, CQ CW marker at 1142. (Marshall-Crete)
9991.0	Air Force 1 working Andrews AFB in USB at 0019. (Alexander-PA)	16980.4	DAM-Norddeich Radio, Germany, CQ CW marker at 1140. (Marshall-Crete)
10000.0	No-ID voice comms over the top of WWV and BPM time signals in USB. Language unknown at 1356. (Rankin-France)	17027.0	FFL8-Saint Lys Radio, France, with CQ CW marker at 1138. (Marshall-Crete)
10230.0	RKA78-Moscow Meteo, Russia, with fax "Fixed Time Progressive Chart" at 1729. (Marshall-Crete)	17278.0	OSU63-Oostende Radio, Belgium, calling "9HVB" at 1736 in USB. (Marshall-Crete)
10500.0	German female 3/2-digit number station in AM at 2234. (Fernandez-MA)	17353.0	OHG2-Helsinki Radio, Finland, working with "UIVH" and "UMFU" at 1420 in USB. (Marshall-Crete)
10665.0	Spanish female 4-digit number station in AM at 0200/0400. (Mazanec-Maple Heights, OH) Heard at 0220 with same traffic. (Carl Pinsonat-Plaquemine, LA) <i>Welcome to the column, Carl, how about sending some crawfish up this way-Larry.</i>	17916.0	Stockholm Radio working Malaysia 943 which was trying to get ahold of another aircraft in USB at 0800. (Koch-IL)
11176.0	MAC 60133 requesting a patch to McQuire AFB through Ascension GCCS at 0241 in USB. Mac flight was a C-141 aircraft. (Mikel Starr-Hadley, MI)	18066.0	AFA-Andrews AFB working SAM 26000 with traffic for Secretary of State in USB at 1712. (Geoff Okey-UK) <i>Welcome Geoff this is a Mystic Star channel-Larry.</i>
11190.0	English female 3/2-digit number station in AM at 2103. (Fernandez-MA)	18230.0	GFL25-Bracknell Meteo, UK, with weather plus RTTY 50 baud RY's and ID at 1205. (Marshall-Crete)
11193.0	LDOC Moscow, Russia, with female operator in Russian working several Aeroflot aircraft in USB at 2253 about flight data comms. (Fernandez-MA)	18648.5	SPW-Warsaw Radio, Poland, transmitting RTTY traffic in the blind for SQA01 at 1459. (Burkart-LA)
11198.6	LYNX-Unid station with CW/SITOR-A idler at 2145. Who??? (Fernandez-MA) <i>I really dunno Bill, this one has been spotted elsewhere and is a mystery-Larry.</i>	18734.0	LOL-Buenos Aires Naval, Argentina, with 5 letter groups and messages about 10 anniversary of SS General Beltrano using 75 baud RTTY at 0144. Message repeated. (Bilodeau-IL)
11205.0	Q7B calling C4Z in USB at 2157. Frequency listed as NASA channel. (Fernandez-MA) <i>My list also shows US Navy tactical-Larry.</i>	18872.0	BZR68-XINHUA news agency Beijing, China, with English language RTTY news items at 1250. (Burkart-LA)
11222.0	Two individuals talking about various domestic concerns: phone book, weather, etc. Used 'OK' when finished with phrase. These 2 call each other about every day or so at this time (0208). Not ham's or fishing boats...what is this? (Gervais-WA) <i>Probably Stockholm Radio, they do provide a telecom service on this channel-Larry.</i>	19438.5	LOR-Puerto Belgrano Naval, Argentina, with weather transmission in Spanish using 5 letter groups. 75 baud RTTY at 0040. (Bilodeau-IL)
11222.5	German Navy 5771 and OJA in comms about a track 90 nautical miles from aircraft position. Then Navy 5771 talks to B6X about aircraft squawking on frequency ??? and position of aircraft from 5771. Had all German or Dutch accents in USB at 2245. (Fernandez-MA) <i>Hummmmm, looks like a German Naval freq-Larry.</i>	20085.0	ISX20-ANSA Rome, Italy, with English weather forecast and sports. Then news regarding a bad auto accident. Copy garbled due to static crashes in 50 baud RTTY at 1525. (Bilodeau-IL)
11226.0	SAM203 working Andrews AFB with phone patch in USB to Ellington CP at 2045. (Burkart-LA)	20147.0	Clean Table with RTTY RY/Quick Brown Fox test tape in the clear at 2008. (Burkart-LA)
11256.0	An aircraft on the ground at Lagos (Nigeria) in comms with a LDOC sounding like YAY-ON-DE. I believe this to be Yaounde, Cameroon, LDOC but several directories don't list this frequency for them. Comms were in English with strong accents. A new frequency for them Larry??? (Fernandez-MA) <i>Could be a new LDOC station for Ethiopian Airlines which uses this frequency-Larry.</i>	20286.5	SOV228B-PAP news agency Warsaw, Poland, with time frequency and call sign information then into Polish RTTY news items at 1400. Stations listed included this frequency, SOT265B-18648.5, SOL242B-SOM214B-12148 and SOH289B-7892.5. (Burkart-LA)
11441.0	Dragnet Victor to Comleaf, needs working frequency for unid station X-906 (13217) primary and W-109 (13247) secondary in USB at 1946. (Burke-AZ)	11423.5,	IRS23-ANSA Rome, Italy, with news at 1539 using 50 baud RTTY. Appears to be parallel to 20085.0. (Bilodeau-IL)
11565.0	English female with 5-letter groups in AM/USB. A message spoken three times followed by groups in slow phonetics then "end of message" spoken one time. At 2110. (Rankin-France) <i>Israeli Mossad station-Larry.</i>	20372.0	Marcaibo Naval, Venezuela, with RTTY RY/SG and quick brown fox test tape in Spanish using 75 baud at 1928. (Bilodeau-IL)
12622.0	7TF8-Boufarik Radio, Algeria, CQ CW marker at 1540. (Marshall-Crete)	20402.0	HDN-Ecuadorian Naval Quito RTTY RY test tape at 1233. (Burkart-LA)
		22377.5	KFS-San Francisco Radio, CA, SITOR-B traffic list at 1740. (Burkart-LA)
		22378.0	FTT91-St. Lys Radio, France, with telex to "Nouva Lloydiana" at 1020 in SITOR-A. (Marshall-Crete)
		22386.5	WCC-Chatham Radio, MA, SITOR-B weather broadcast at 1245. (Burkart-LA)
		22448.7	GKB3-Portishead Radio, UK, CQ CW marker at 1955. (Marshall-Crete)
		22592.0	A9M-Hamala Radio, Bahrain, CQ CW marker at 1905. (Marshall-Crete)
		22682.0	PCH70-Scheveningen Radio, Netherlands, with CQ CW marker at 1840. (Marshall-Crete)
		22714.0	DAJ-Norddeich Radio, Germany, with "Hier ist Norddeich Radio" ID at 1428 in USB. (Marshall-Crete)
		22888.0	DFZG-MFA Belgrade, Yugoslavia, with RTTY traffic including telegrams for various embassies and parallel to 20132.0. (Burkart-LA)
		23402.0	Atlas working Flint 005 + ?931, enroute to 931's location for a couple of days. Atlas told them to go to Tango channel at 0905. (Koch-IL)
		25377.0	UQK-Riga Radio, Latvia, with CQ CW marker at 1655. (Marshall-Crete)

The Scanning Report

Bob Kay

c/o MT, P.O. Box 98
Brasstown, NC 28902



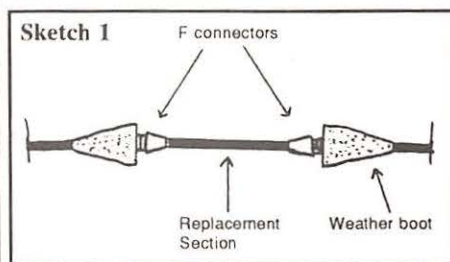
Installing a mobile scanning rig is easy.

Going Mobile

Installing a mobile scanning rig is not a difficult task. It merely requires a little planning and some creative thinking. If you're ready to give it a try, here are a few ideas and hints that will help to give your installation a professional touch.

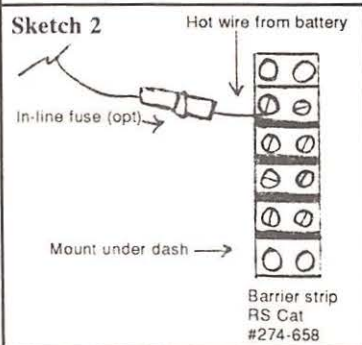
Let's begin with the selection and installation of your mobile scanning antenna. The easiest method is to install an antenna converter. This device electrically converts your factory installed antenna to receive the scanner bands. Installation time is approximately 10 minutes. Grove Enterprises offers an antenna converter for \$14.95 (Cat. #CPL-63). You can also find antenna converters in your local Radio Shack store.

For optimum results, however, a separately installed scanning antenna is recommended. If you feel uneasy about drilling holes into your car, relax. Magnetic base antennas work quite well. Best of all, they can easily be removed and stored inside your vehicle. With a magnetic base antenna, the cable usually enters the vehicle through a door or trunk opening. After a period of time, the repetitive use of the door or trunk will "crush" the coax. The only alternative is to cut the line and insert a new section by utilizing weather boots and "F" connectors (Sketch #1). When the replacement section becomes worn, it can be replaced by simply unfastening the connectors.



To route coax cable from the trunk area, push a coat hanger between the back seat and the side of the vehicle. When the hanger enters the rear seat area, fasten the coax to the opposite end and then pull the cable into position.

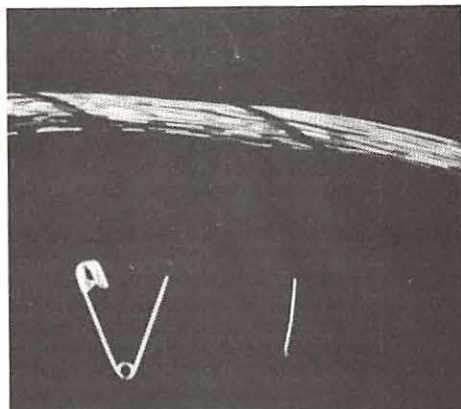
Coax cable can be routed beneath the carpet in your vehicle in the same manner. The straightened coat hanger is pushed under the carpet with the coax cable pulled behind. It may be necessary to cut the carpet with a razor knife at the entrance and exit points. To prevent the carpet from fraying at the cuts, use a fast drying, waterproof glue.



Selecting a location for the scanner radio is another factor that merits careful consideration. Care should be taken to avoid blocking air conditioning and heater ducts. Don't place the radio in an area that restricts the movement of you or your passengers. The visibility of the unit may also be a factor if you park your car in a high crime area.

After the location has been selected and the mount securely fastened in place, it's time to

Can't determine which wire to choose? Stick it with a pin!



select a power source. Some hobbyists are content with using the cigarette lighter. An adapter is pushed into the socket and power is provided to the radio. Although the cigarette lighter is convenient, most scanner buffs prefer a more professional touch. To accomplish this, the scanner radio is spliced directly into the vehicle's wiring.

Installation of a 12 volt power wire should be done with extreme care. In today's computer controlled cars, a short circuit can cause extensive damage to solid state circuitry. If you're not comfortable with the following suggestions, ask a professional for help.

- 1) Install a "push in terminal" into the fuse box. Attach a 16 gauge wire between the terminal and your radio.
- 2) A single wire can be isolated and tested by sticking it with a straight pin or safety pin. The voltage in the wire can then be determined by placing a voltage meter between the pin and ground. If you want to use the radio when the ignition is off, simply remove the keys and use the pin to search for a wire that remains "hot."
- 3) Install a single "hot" wire from the battery into the passenger compartment. Terminate the wire into a terminal block and power your scanner and other accessories directly from the new terminal (Sketch #2).
- 4) Do not attempt to make any alterations or splices with the battery connected.

After the installation is complete, turn on the radio and scan a wide selection of frequencies. If you're satisfied with the performance, start the engine and listen for noise interference. Noise problems can be controlled by installing an ignition noise suppressor kit. These kits can be purchased from Radio Shack and auto supply stores.

Installing a complete mobile scanning rig (antenna, mounting bracket and power cable), will probably take the better part of a day. Don't fool yourself into believing that you can accomplish the installation in a few hours. Plan your installation, take your time and give yourself the professional installation that you deserve. If you have problems or questions, drop me a line at P.O. Box 98, Brasstown, NC 28902.

Treasure Hunt

This is your last chance to win the Weather Monitor II from Davis Instruments. The Weather Monitor II is a top of the line professional weather monitoring station. By merely pushing a touch sensitive key pad, you can instantly see the inside/outside temperature, barometric pressure, wind direction, wind speed, humidity, time and date. Press another button and instantly recall the high and low readings of any setting.

The Weather Monitor II features an easy-to-read digital display that measures 1-7/8" x 4-3/8". The illuminated control module is connected to a roof top anemometer, wind vane and outside temperature sensor.

Installation of the anemometer/wind vane is easy—simply attach it to the mast of your rooftop scanning antenna.

To win the Weather Monitor II for your listening post, here are the clues:

1. Weather fronts move across the Nation from West to East. True or False?
2. The U.S. Weather Bureau was established in what year?
3. What is a "Weathercock?"
4. Provide a one word definition for the term "Weatherglass."
5. Altostratus is a cloud form. True or False?

In addition to the Weather Monitor II, Davis Instruments has also included their "WeatherLink." The WeatherLink connects between the Weather Monitor II and the serial port on your personal computer. All hardware is provided and installation of the software only takes a few minutes.

The WeatherLink provides the ultimate in weather monitoring. It can create graphs, calculate average weather conditions, generate summaries, analyzes trends and much more. It also allows you to monitor and control many of the functions of the Weather Monitor II via your computer screen. System requirements for the WeatherLink are 640K, MS-DOS 2.1 or higher, CGA, EGA or VGA monitor. The software supports a wide variety of the printers on today's market.

The Weather Monitor II retails for \$295. The WeatherLink retails for \$150. Davis Instruments has a catalog that features a variety of Weather Monitoring Systems that can easily fit into your listening post and budget. For more information contact: Davis Instruments, 3465 Diablo Ave, Hayward, CA 94545. The phone number is (510) 732-9229.

Frequency Exchange

Grab your scanner radio, a comfortable pair of shoes and let's visit **St. Charles, Missouri**. As we walk along historic Main Street, James Stulce has invited us to monitor his favorite frequencies:

St. Charles Sheriff

F-1 155.490 Primary	F-4 155.490 Car to car
F-2 155.730	F-5 155.475 Mutual Aid
F-3 155.835	F-6 156.000 Car to car

St. Charles Police/Fire/Ambulance (Trunked)

856.2625 857.2625 858.2625 859.2625 860.2625

From **Columbus, Ohio**, a person called "Mad Dog" has invited us to monitor the following:

47.50 Americap Ambulance	452.500 Bobcat Taxi
154.110 Columbus Fire	462.050 Roto Rooter plumbers
154.965 Sewer Department	463.500 R&R Security
156.180 Highway Department	464.450 Mid OH Car Recovery

The scanning action in **Oklahoma City, Oklahoma**, can be found on the following frequencies:

37.120 Oklahoma Co Sheriff	154.665 Crime Bureau
37.26 Oklahoma Co Sheriff	154.785 Crime Bureau
44.64 Game Wardens	154.830 Narcotics
44.70 Oklahoma Hwy Ptrl	463.60 Remington Pk Security
44.84 Game Wardens	463.8875 Crossroads Mall Sec
44.90 Oklahoma Hwy Ptrl	464.3375 Crossroads Mall Sec
45.10 State Prisons	464.675 Quail Springs Mall
45.22 Oklahoma Hwy Ptrl	464.7875 No Park Mall Security

The above frequencies were provided by Marvin Corteway. The frequencies printed below were sent in by Johnny Knight. Johnny lives in **Monroe, North Carolina**, and he uses a PRO-2006 and PRO-34.

42.520 Highway Ptrl dispatch	159.135 Union Co Govt
154.22 Union Co Fire & Rescue	451.075 Union Co Govt
154.280 NC State Fire	453.525 Union Co Sheriff
155.280 NC State Rescue	453.925 Monroe City Police

GUIDE TO FACSIMILE STATIONS

12th edition • 416 pages • \$ 35 or DM 50

The recording of FAX stations on longwave and shortwave and the reception of meteorological satellites are fascinating fields of radio monitoring. Powerful equipment and inexpensive personal computer programs connect a radio receiver directly to a laser or ink-jet printer. Satellite pictures and weather charts can now be recorded automatically in top quality.

The new edition of our FAX GUIDE contains the usual up-to-date frequency lists and precise transmission schedules, including those of all US Air Force, US Coast Guard and US Navy stations worldwide. It informs you about new FAX converters and computer programs on the market. The most comprehensive international survey of the "products" of weather satellites and FAX stations from all over the world is included: 358 sample charts and pictures were recorded in 1991 and 1992! Here are that special charts for aeronautical and maritime navigation, the agriculture and the military, barographic soundings, climatological analyses, and long-term forecasts, which are available nowhere else.

Additional chapters cover

- List of 310 frequencies monitored in 1991 and 1992. Call sign list.
- Exact schedules - to the minute! - of 90 FAX stations, and of meteorological satellites GMS (Japan), GOES (USA), and METEOSAT (Europe).
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Further publications available are *Guide to Utility Stations* (10th edition), *Radioteletype Code Manual* (11th edition) and *Air and Meteo Code Manual* (12th edition). We have published our international radio books for 23 years. They are in daily use with equipment manufacturers, monitoring services, radio amateurs, shortwave listeners and telecommunication administrations worldwide. Please ask for our free catalogue, including recommendations from all over the world. All manuals are published in the handy 17 x 24 cm format, and of course written in English.

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158.805 Charlotte/Meck Schools 461.300 WSOC-TV "Live Eye"
158.955 Charlotte/Meck Schools

If you like warm weather, you'll enjoy visiting **Muscle Shoals, Alabama**. Jonathan Melton lives nearby and monitors these favorite frequencies:

151.055 Highway Dept	451.050 Florence Elec Dept
155.175 Metro Shoals Ambulance	451.100 Cherokee Water & Gas
155.205 Colbert Co Rescue	451.125 Muscle Shoals Elec
155.235 Helen Keller Hosp	451.200 Florence Water Dept
155.585 Alabama St Prison	451.225 AL Power Company
155.670 Street Dept.	451.675 Florence Gas Dept
160.245 Norfolk So Railroad	453.675 AL Dept of Pub Hth
160.830 Norfolk So Railroad	453.875 Campbell City Govt
160.950 Norfolk So Railroad	

If you want Jonathan's complete list of approximately 146 frequencies, it's free. Send a #10 SASE to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

The "Big Three" auto-makers are routinely monitored by Russ Hill in **Warren, Michigan**. Here are the frequencies that Russ provided.

153.320 GM	462.350 GM	462.450 Chrysler
462.200 Chrysler	462.400 Ford	462.475 GM
462.250 GM	462.425 GM	462.500 GM
462.300 Ford		

Our next invitation arrived from **East Brunswick, New Jersey**. Louis Olesvay Jr., claims that the following frequencies will fill your scanner with plenty of action.

44.820 Mosquito control	155.070 Juvenile Trng School
47.580 Woodbridge Twnp schools	155.385 So Amboy Hosp

48.080	Monroe Water Dept.	155.535	Milltown Police
151.025	Highway Dept.	453.375	Brunswick Police
151.115	Piscataway Road Dept.	453.900	Brunswick Police
151.160	Parks Dept.	461.825	Brunswick School Buses
151.190	Parks Dept.	464.475	Fashion Plaza Security
151.995	Woodbridge Mall Maint.	464.525	Woodbridge Ctr Mall
153.500	South River Elec. Dept.	464.925	Home for disabled
153.875	Middlesex College Police	467.750	Brunswick Mall Security
154.570	Wardlow Hartridge School		

John Holley monitored the riots in **Los Angeles, California**, and he sent in the following frequencies that were used by the military.

36.710	Army Convoys	148.650	NG Emergency Net
36.890	Army Convoys	149.025	USMC Convoys
40.55	National Guard (NG) Ops	149.090	USMC MP
41.45	NG Ops	149.275	USMC "Rocky Center"
41.65	NG Tactical	149.30	USMC Convoys
47.00	NG Operations	150.100	USMC Command Post
138.025	USMC MP	153.755	Disaster Control
139.675	USMC MP		"LA Microwave"
		154.160	Disaster Ctrl "OES-1"

If you want the Frequency Exchange to visit your town, send a list of your favorite local frequencies to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902. All requests for anonymity will be granted.

General Mobile Radio Service

The "GMRS" was originally called Class A CB. It was primarily used by small business for short range radio communications. Since that time, the FCC has stopped issuing GMRS licenses to new businesses.

In today's world, the band is widely used by public service organizations. Emergency response teams such as "REACT" often use the frequencies to co-ordinate activities. Repeaters are also permitted and it's possible to monitor GMRS transmissions from considerable distances. The GMRS frequencies are paired in the following manner (Base/Mobile):

462.550/467.550 462.600/467.600 462.650/467.650 462.700/467.700
462.575/467.575 462.625/467.625 462.675/467.675 462.725/467.725

In addition to the above frequencies, there are low power communications that are restricted to 5 watts. These frequencies are often used to co-ordinate local special events:

462.5625 462.6625 462.5875 462.6875 462.6125 462.7125 462.6375

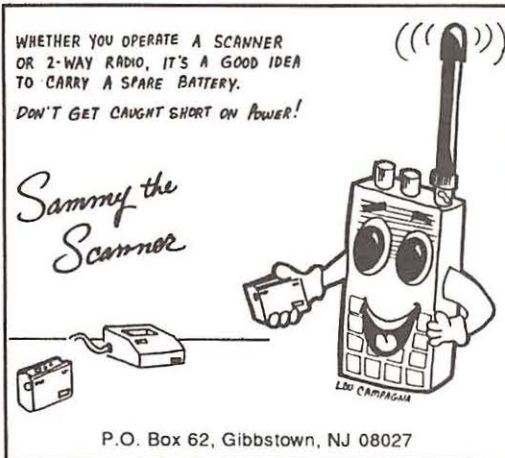
Letters Are Us

As scanner buffs, it is our duty to keep the airwaves free. In past columns, I encouraged all of you to write a letter to your Congressman and Senators. We certainly don't need more restrictive scanner laws.

Writing letters to your representatives can be a hassle. Most people worry if the format of their letter is correct, they worry about the spelling of proper names, and they usually don't know the exact address.

Well, all that has changed. The worry and hassle of letter writing to your government officials is as easy as pushing a button. Parsons Technology has released the "Personal Advocate." The software program includes the names and addresses of your Congressional Representatives and Senators. The addresses of federal agencies and major corporations are also included in the database.

Parsons Technology intends to release regular updates to the database. For more information, call Parsons toll free, 1-800-223-6925. (Letter from Michael Miller, Parsons Programmer.)



Scanners in the News

- Sheriff deputies in Craven County, North Carolina, were chasing a suspect in a stolen car. The deputies lost the suspect after he abandoned the car and ran into the woods.

When the suspect emerged from the woods and tried to hitch a ride, he was picked up by two men who held him until sheriff deputies arrived. The two men were scanner buffs who had monitored the entire incident on a scanner radio.

- Wiretapping charges against a Cleveland, Ohio, man who monitored and taped cellular phone conversations have been dropped. The judge ruled that although federal law prohibits cellular phone conversations, Ohio has yet to pass similar protective laws. (News clipping from Tom Maslanka.)

- A Manchester, New Hampshire, police detective chased and captured a man suspected of tying up a 32 year old woman and stealing her Jaguar.

The detective was alerted to the location of the stolen car by an off duty police dispatcher who had been listening to a scanner radio. (News clipping from the *Union Leader*.)

Class A Or B

Do you know the difference between computers that have a class B and class A standard?

Computers emit radio signals that can interfere with radio reception. Because of this, computers are regulated by the Federal Communications Commission. Computers certified by the FCC as having a Class B standard are less likely to cause interference to radio reception. Only class B certified computers may be sold for use in a residence. However, commercial class A certified units can often be purchased as used equipment.

Class B units carry a label with an FCC ID number. If you're in the market for a computer, look for the FCC classification. It's your best buy—especially if you plan to use the computer in your listening post.

Pocket Scanner

The Realistic PRO-27 is a two channel crystal receiver that can monitor 144 to 174 and 450 to 512 megahertz. The radio has a squelch, volume control and an earphone jack. A belt clip, detachable antenna and one year warranty make this radio a genuine steal at \$49.95.

A nine volt battery will power the unit for several days and crystals are \$4.98 each. If you only need to monitor a few channels, or if you simply want a scanner radio that can fit in your shirt pocket, check out the PRO-27 at your local Radio Shack.

Next Month

Summer may be over, but there's no reason to put away your scanner radio. September begins a new scanning season—see you next month.

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Digital programmable 200 channel hand held scanner with raised button keyboard for easy programming of the following frequency ranges: 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-956 MHz. * Features include: Scan delay, memory backup, key pad lock, sidetone liquid crystal display, channel lockout, 10 twenty channel banks, direct channel access, automatic search, full one year factory warranty, 10 priority channels, Ni-Cad battery pack, AC adapter/charger, flexible rubber antenna carry case are all included. Size is 2-11/16" Wx1-3/8" Dx7-1/2" high. (Optional extended 2 yr. warranty \$29.99, 3 yr. extended warranty \$39.99.) (* Excludes Cellular)

#CC-008 Heavy Duty Leather Carry Case \$27.99

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BEARCAT BC950XLT	249.99	(7.00)
COBRA SR901	74.99	(6.00)

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COBRA CB Radios..... In Stock
UNIDEN CB Radios..... In Stock
Two-Way Radio Batteries..... In Stock
Scanner Antennas..... In Stock
Power Supplies..... In Stock

RELM RH606B..... 414.99 (9.00)
RELM UC202 (2 or more)..... 129.99 (6.00)

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BP70	16.99	FBE	5.99
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World Radio	18.99
Survival Directory	6.95
Rail Scan	7.95
Police Call	8.69
Scanner Modification	17.99

RELM RH-256NB HIGH BAND TWO-WAY RADIO



\$339.99
SPECIAL PACKAGE DEAL
(Plus \$9.00 Shipping Each)

16 channel digital readout two-way radio. Covers high band frequency range of 148-162 MHz without retuning. Perfect two-way radio for ambulance, police, fire, tow trucks, taxis, commercial companies who use this band. Features include CTCSS tones built-in, priority, 25 watts output, channel scanning, back lighted keyboard, message light, time out timer, scan delay, external speaker jack. Size is 2 1/4" Hx6 1/2" Wx10 1/4" D.

SPECIAL PACKAGE DEAL includes RH-256NB, mobile microphone, 1/4 wave body mount antenna, mobile mounting bracket and mobile power cord for all the low price of \$339.99

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Our best selling mobile scanner. 16 channel. AC DC. programmable, digital AC DC cords, telescopic antenna, mobile mounting bracket, weather search, priority 29-54 MHz, 136-174 MHz, 406-512 MHz, external speaker and antenna jack

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100 Channel Digital
Programmable
Hand-Held Scanner

\$159.99
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Our best price ever on a full featured complete package hand-held scanner. Manufactured by Uniden. Features include 11 bands of weather, aircraft, public service, trains, marine, plus more (29-54 MHz, 118-174 MHz, 406-512 MHz), 10 channel banks, 10 priority channels, lighted LCD display, earphone jack, channel lockout, AC/DC operation, scans 15 channels per second, track tuning. Special package deal includes following accessories: AC adapter/charger, rechargeable Ni-Cad battery pack, flexible rubber antenna, carry case.

SANGEAN ATS-803A SHORT WAVE RECEIVER

\$168.99
(\$7.00 shipping)



AM/FM/LW and 12 shortwave bands plus FM stereo, BFO for SSB reception, clock radio. Includes AC adapter, telescopic antenna, stereo headphones, and shoulder strap.

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Programmable, digital, AC/DC operation. Frequency coverage 29-54 MHz, 136-174 MHz, 406-512 MHz. Weather button, priority, lockout button, squelch includes AC adapter, telescopic antenna.

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COBRA

SR-901

AVAILABLE ONLY
FROM SCANNER
WORLD

ONLY \$74.99 Each

(Plus \$6.00 Shipping Each)
\$69.99 (2 or more)

Features include: 10 programmable channels, one touch memory programming, external speaker jack, 29-54 MHz, 136-174 MHz, 400-512 MHz, squelch, lockout, full frequency digital readout, AC or DC operation, retains memory up to 3 days without power, scan button. Includes AC adapter, telescopic antenna, and complete operating instructions. Size: 7 1/4" W x 2" H x 7 1/4" D. One year factory warranty. (Optional mobile cigarette lighter cord #901MPC \$4.99)

UNIDEN BEARCAT BC 800XLT



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BASE
SCANNER

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Receive police, fire, ambulance, cordless phones, marine, trains, weather, ham, stock cars, public service plus much more. Frequency coverage 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-912 MHz (continuous), 40 channels, AC/DC operation, digital programmable, memory backup requires 2 AA batteries (not included), telescopic antenna included, AC power cord included, external speaker jack, external antenna jack. Dimensions: 9 1/4" D x 4 1/2" H x 12 1/2" W. Channel lockout, direct channel access, scan delay, priority, digital display, auto weather button, automatic search, track tuning.

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Digital Programmable
100 Channel Scanner

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—ONLY AVAILABLE FROM
SCANNER WORLD—

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\$39.99
(\$4.00 Shipping Each)

GLASS MOUNT ANTENNAS FOR TRANSCEIVERS

Includes mounting kit and cable. Low Band, High band and UHF band include PL259 connectors. 800 cellular band antenna includes TNC connector.

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GM-800 Cellular Telephone Band	\$34.99 (\$4.00)

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Beginner's Guide to Test Equipment

One of my most guilty pleasures has to be old 1950's Science Fiction movies. You know the kind—they always have a monster, a dashing hero, a scientist and his well endowed daughter. And of course they're more fun to watch in black and white. Do you suppose Ted Turner will still let me stay in the Omni CNN Hotel at the Monitoring Times Convention even though I am against "colorizing" old movies?

What's the point here, Uncle Skip?

Although I am usually very impressed with the scientist's sexy daughter, what I enjoy most in these old films are the tables covered with test gear. You always see dozens of boxes designed to test and measure all manner of things.

No matter how basic a beginner you may be, I bet you have the same fascination for the hardware that goes into designing and repairing radio receivers. You may be a long way off from tearing into your own equipment; still, knowing your way around a test bench is neat knowledge to put into your back pocket for future use. With that, Old Uncle Skip's Movie Emporium and Zen Chess Parlor presents...

UNCLE SKIP'S GUIDE TO TEST EQUIPMENT

Here is a look at some of the more common stuff you might see on the average workbench at your friendly neighborhood radio fix-it shop. As you move along in your radio monitoring career, you may find owning a few of these pieces of equipment to be highly desirable, not to mention, very impressive.

Meters, Meters and More Meters

To find out what is wrong with a receiver or to make a receiver perform at its optimum level, you need to take quite a few measurements. Most shops will have a few meters set up close to the action.

Probably the most common piece of electronic test gear is the VOLT-OHM-MILLIAMMETER (VOM). As a matter of fact, even if you are a beginner so new to radio that this is the first article on radio you have ever read, you may as well go out and buy a VOM. Within the first year as a radio hobbyist you will undoubtedly find a dozen uses from checking battery voltages to looking for shorts in antenna feedlines. But, unless you plan to go tearing into radios in a big way or build your own equipment,

the VOM will be all the test gear you will ever need. (I'm going to get letters on that statement!)

The VOM measures AC and DC voltage, resistance and amperage. It can be used to detect signals within the circuit, test resistors, capacitors, diodes and transistors. Throw in a few formulas from a basic electronics textbook and you will be able to measure just about everything that has any real meaning inside your receiver. (Those people writing those nasty letters now have a second paragraph.)

One version known as an FETVOM (FET means FIELD EFFECT TRANSISTOR) provides a high impedance that allows for more accurate voltage measurements in environments that would trouble a regular VOM. The predecessor of the FETVOM was a meter called the VTVM or VACUUM TUBE VOLT METER. You will still see VTVMs on quite a few test benches happily measuring away the old fashioned way. Great tube gear *never* dies!

As in most things electronic, digital readout versions of the VOM have come on the scene. These are known as DMMs or DIGITAL MULTIMETERS. These new-fangled meters are great for some things but leave a lot to be desired when measuring "peak" voltages, resistances, etc. When adjusting a circuit for a peak whatever, good old fashioned analog meters are the only way to fly. (That's paragraph three for all those nasty-grams.)

Signals Ahead

If you have been following along with this column and some of the other technical columns in the pages of *MT*, you have probably heard it said that receiver operation involves both RADIO FREQUENCIES (RF) and AUDIO FREQUENCIES (AF). Actually, when you think it through, a receiver is just a box full of parts that turn radio frequencies (What comes through the air and to your antenna) into audio frequencies (What comes out of your speaker or headphones).

Checking to see if all of those parts inside the receiver are doing their job often requires a device that generates RF or AF signals to give the VOMs, FETVOMs, DMMs and VTVMs of the world something to measure. The RF signal generator injects a signal into the circuit to allow for alignment and measurement of the receiver's RF stages.

Can you guess what the AF signal generator does? Bingo, it does the same thing for the AF stages of the receiver. Both types of generators can also be used to perform very sophisticated

circuit testing that goes well beyond the scope of simple receiver alignment or repair.

A more complicated version of the AF generator is a tool known as the FUNCTION GENERATOR. This box not only generates audio frequencies but modifies their waveforms to allow for additional testing opportunities especially on the circuits that make up modern scanning receivers.

Get Along Lil' Frequencies

One of the neatest pieces of test equipment to come out of the digital age is the frequency counter. While you might find it used for some sophisticated purposes in physics and engineering labs, radio people are happy to have it around as a sort of all purpose digital readout.

Serious scanner monitors purchase portable frequency counters to go hunting for unknown frequencies. If you come to the *MT* convention, you will see folks chasing around behind the hotel security guards waiting for them to key up their walkie-talkies. Since Old Uncle Skip is fond of old tube type receivers, I have become adept at wiring in frequency counter outputs to give my tube gear's analog readouts a boost in accuracy.

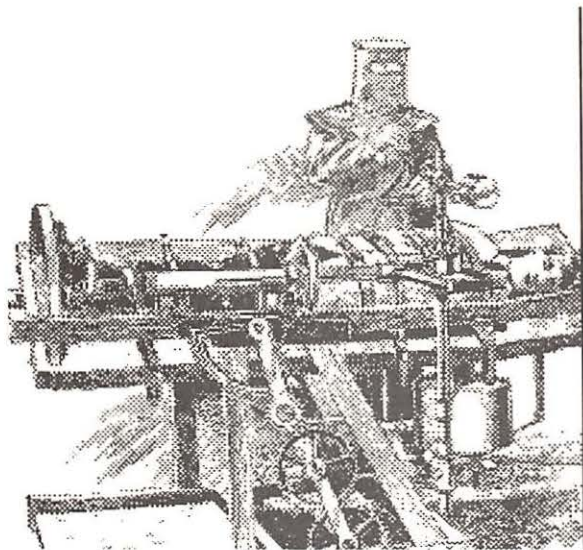
This is what frequency counters do best. They give an accurate frequency readout when the readout on your receiver may be in question either at the dial or because something inside is out of kilter. Amateur radio operators, by law, have to keep accurate tabs on their transmitting frequency to be sure they do not stray from their legal bands. The frequency counter has made this task an easy one.

The Silly Scope

Like your first love, your first car and your first "real" receiver, you will never forget your first OSCILLOSCOPE. Mine was a well-used Bell and Howell Schools job that I never did find a manual for. Still I learned more about electronics making mistakes with that thing than I did from all the books I have ever read.

A simple explanation of what makes up a basic oscilloscope would go something like . . . Take a television set. Take out the circuits that receive the audio and video signals but leave everything else in place. Hook up a couple of test leads. Viola, you have an oscilloscope! (Remember folks, I am a professional. Don't try this at home!)

Okay, it's not quite that simple but it is close. The oscilloscope gives a visual representation of



Always remember to take proper safety precautions when conducting any "experiments" involving electricity.

frequency, amplitude and period of a signal, all at the same time, allowing for some very sophisticated measurements. Even your home computer can be turned into a very sophisticated oscilloscope.

More Power to You

No self respecting electronics work bench would be complete without a brace of power supplies. Most hot setups include at least one variable AC and one variable DC power source. These power supplies can either take the place of the supply in the unit under test or they can be used to check out individual circuits or components.

Any smart puppy doing radio repair work will also include an ISOLATION TRANSFORMER as part of his or her power supply array. This device isolates the unit under test from the AC line voltage coming out of the wall socket. This is done for safety considerations as well as accuracy in test measurements.

Accept no Substitutes...NOT!

Electronic components such as resistors and capacitors are common in most circuits. They are also known to fail from time to time. Sometimes it will show up as a degradation of performance rather than fizzling out entirely. The quickest way to determine the integrity of these components is often not to check them with test equipment, but to simply swap them out of the circuit and see what happens. RESISTOR and CAPACITOR SUBSTITUTION BOXES are designed for this purpose.

This is a Test

If the owner of the work bench we are looking at is actually starting to make some money in the radio repair business, he or she will

begin to acquire several component specific testing machines.

The classic TUBE TESTER could until recently be found in any Radio Shack. Now these devices are as hard to locate as the tubes themselves. However, if you are going to play in the land of vacuum tube receivers, you will need to locate the nearest tube tester or you will be forced to resort to some very tricky games with your variable power supplies and voltage meters.

As for transistors, most fail in such a way that they can be checked with a VOM. But for all those other transistor failures that Murphy's Law predicted, the TRANSISTOR TESTER was developed. You probably will never choose to buy this piece of equipment for home use because, overall, the cost of replacing transistors is very low and the price of this tool is somewhat high.

The same could be said for the latest line of INTEGRATED CIRCUIT TESTERS. Most of the failures with ICs are pretty straightforward. Also, as you move into the world of IC's you get very close to the "replace the whole darned board, it's cheaper" school of repair.

Is That All There Is?

No way, Jose. We have barely scratched the surface. If you were to join up with many of your radio monitoring compatriots and enter the amateur radio realm, you would also need equipment that addresses the needs of transmitters. You would need hardware with such unflattering names as DUMMY LOAD and DIP METER. For now, be content in the knowledge that you can take a look at a technician's work bench and have an idea if he or she has the hardware to help you out if your receiver goes on the blink.

If you ever run across a manual for the Bell and Howell Schools oscilloscope, drop me a line. I'd love to see what I've missed all these years.

MT

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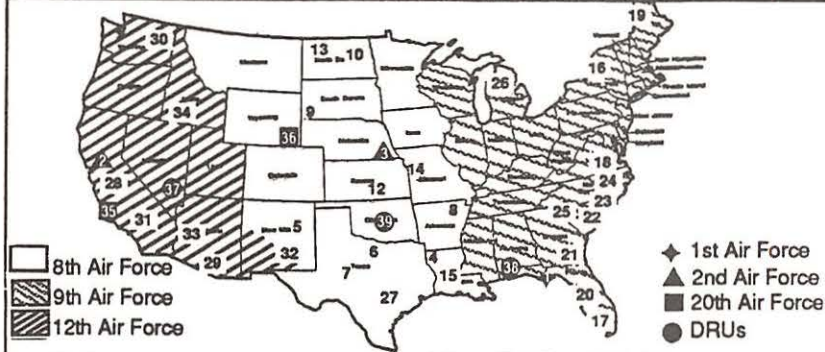
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Air Combat Command Resources



1st Air Force

1. Tyndall AFB, Fla.- 325th Fighter Wing, Headquarters 1st AF, Regional Operations Control Center- ROCC- and SE Air Defense Sector. F-15

Other 1st AF units include: NEADS at Griffis AFB, N.Y.; NWADS at McChord AFB Wash.; SWADS at March AFB, Calif., and Air Forces Iceland.

2nd Air Force

2. Beale AFB, Calif.- 9th Reconnaissance Wing. Headquarters 2nd AF. U-2 and KC-135.

3. Offutt AFB, Neb.- 55th Wing, Headquarters U.S. Strategic Command, 544th Intelligence Wing and Air Force Global Weather Central. EC-135, E-4B and RC-135.

8th Air Force

4. Barksdale AFB, La.- 2nd Wing, Headquarters 8th AF. B-52, KC-135.

5. Cannon AFB, TX.- 7th Bomb Wing. F-111 and EF-111.

6. Carswell AFB, TX.- 7th Bomb Wing. B-52. Scheduled for closure in September 1993.

7. Dyess AFB, TX.- 9th Bomb Wing. B-1B.

8. Eaker AFB, Ark.- KC-135. Scheduled for closure in December 1992.

9. Ellsworth AFB, N.D.- 28th Bomb Wing and 321st Missile Wing. B-1B and Minuteman III.

10. Grand Forks AFB, N.D.- 319th Bomb Wing and 321st Missile Wing. B-1B and Minuteman III.

11. K.I. Sawyer AFB, Mich.- 410th Wing. B-52.

12. McConnell AFB, Kan.- 384th Bomb Wing and 91st Missile Wing. B-52 and Minuteman III.

14. Whiteman AFB, Mo.- 351st Missile Wing. Minuteman II. B-2s to arrive in late 1993.

9th Air Force

15. England AFB, La.- Scheduled for closure in December 1992.

16. Griffiss AFB, N.Y.- 416th Bomb Wing and Rome Laboratory. B-52.

17. Homestead AFB, Fla.- 31st Fighter Wing. F-16.

18. Langley AFB, Va.- 1st Fighter Wing and Headquarters ACC. F-15.

19. Loring AFB, Maine- 42nd Bomb Wing. B-52. Scheduled for closure in September 1994.

20. MacDill AFB, Fla.- 56th Fighter Wing (scheduled to inactivate in September 1994). Headquarters U.S. Central Command. F-21.

21. Moody AFB, Ga.- 347th Fighter Wing. F-16. The 2nd Combat Communications Group at Patrick AFB, Fla., and the 5th CCG at Robins AFB, Ga., are aligned under the 347th Fighter Wing.

22. Myrtle Beach AFB, S.C.- 354th Fighter Wing. A-1. Scheduled for closure in March 1993.

23. Pope AFB, N.C.- 23rd Wing. A-10 and C-130.

24. Seymour Johnson AFB, N.C.- 4th

Wing. F-15E and KC-10.

25. Shaw AFB, S.C.- 363rd Fighter Wing and Headquarters 9th AF. F-16.

26. Wurtsmith AFB, Mich.- 379th Bomb Wing. B-52. Scheduled for closure in June 1993.

9th AF includes the 33rd Fighter Wing of Eglin AFB, Fla., with F-15s, and 7th Airborne Command and Control Squadron at Keesler AFB, Miss., with EC-130s.

12th Air Force

27. Bergstrom AFB, TX.- 67th Reconnaissance Wing and Headquarters 12th AF. RF-4C. Scheduled for closure in June 1993.

12th AF to move to Davis Monthan AFB, Ariz., in mid-1993.

28. Castle AFB, CA.- 93rd Bomb Wing (conducts training of all B-52 and KC-135 aircrews). Scheduled for closure in September 1995.

29. Davis-Monthan AFB, Ariz.- 355th Wing, 12th AF Headquarters in mid-1993. A-10, OA-10 and EC-130.

30. Fairchild AFB, Ariz.- 92nd Bomb Wing. B-52, KC-135 and UH-1.

31. George AFB, CA.- 35th Fighter Wing. F-4E and F-4G. Scheduled for closure in December 1992.

32. Holloman AFB, N.M.- 49th Fighter Wing. F-117 and AT-38. 20th Fighter Squadron, with German air force F-4Es.

33. Luke AFB, Ariz.- 58th Fighter Wing. F-15E and F-16.

34. Mountain Home AFB, Idaho- 366th Wing. EF-111. In the process of establishing on Air-Intervention Composite Wing with F-15, F-15E, F-16, B-52, E-3 and KC-135.

Also included in the 12th Air Force are Howard AFB, Panama, with the 24th Wing (C-27s), and the 388th Fighter Wing at Hill AFB, Utah, with F-16s.

20th Air Force

35. 20th AF, with headquarters as a tenant unit at Vandenberg AFB, Calif., includes the 44th Missile Wing at Ellsworth AFB; the 321st Missile Wing at Grand Forks AFB; the 341st Missile Wing at Malmstrom AFB, Mont.; and Test Wing at Vandenberg AFB and the 351st Missile Wing at Whiteman AFB.

35. F.E. Warren AFB, Wyo.- 90th Missile Wing. Peacekeeper and Minuteman III.

Direct Reporting Units (DRUs)

37. Nellis AFB, Nev.- U.S. Air Force Fighter Weapons Center (57th Fighter Wing, U.S. Air Force Fighter Weapons School and 99th Tactics and Training Wing) and U.S. Air Force Air Demonstration Squadron (Thunderbirds). F-15, F-15E, F-16, F-111 and A-10.

38. Air Warfare Center- Eglin AFB, Fla. 79th Test and Evaluation Group. EF-111, F-4G, F-15 and F-16.

39. 552nd Air Control Wing- Tinker AFB, Okla. E-3. The 552nd ACW will realign under 8th AF in June 1993.

The 3rd Combat Communications Group at Tinker is aligned under the 552nd ACW.

There've Been Some Changes Made!

Anyone listening in on the Strategic Air Command's shortwave frequencies lately will tell you something is amiss. Check out the primary frequencies of 6.761 MHz and 11.243 MHz and you'll see what I mean. These normally busy channels, bustling with top-notch military activity, are strangely quiet. Occasionally, you'll hear some traffic but not nearly the volume that monitors are used to. Where have all the bombers, tankers and fighters gone? Has peace broken out and has the U.S. Military retired all its aircraft?

Not hardly. The silence on the regular channels is evidence that sweeping changes have taken place. As many who monitor the military already know, the Pentagon is in the midst of restructuring its military might. As of June 1st, Strategic Air Command, Tactical Air Command and Military Airlift Command ceased to exist. These three major military commands have all been combined into one streamlined command with the new name of Air Combat Command.

Air Combat Command was born out of the new world order and is the child of the ever changing geopolitical climate. In the eyes of the U.S. Military, World War Three was fought, and the U.S. won without firing a shot. The only weapons used were dollars and rubles. The Soviet Union just couldn't keep up with the military spending dictated by the weapons race and still afford to clothe, feed and house its people. The end result was the collapse of the communist state. The repercussions are still being felt today as former Soviet republics engage in bloody civil wars. With no strong Soviet military pressure to govern and control these warring factions, everyone with a political cause has taken up the gun again in trying to establish their own control.

The repercussions have been felt here in the U.S. as well. With no constant Soviet nuclear threat to contend with, the U.S. doesn't need a large nuclear strike force kept on 24 hour alert. The first signal of the official end of the Cold War came when B-52s and B-1B bomber crews were taken off around-the-clock alert. Another "first" was experienced when the nation's fleet of constantly orbiting EC-135 flying command posts were grounded. They now only fly occasional practice missions.

The cost of keeping a large strike force on alert is not only taxing to the military but hard on the economy and the tax payer as well. With no threat, there's no longer a need to keep up this expensive strategy. It was summed up best by a sign at Ellsworth AFB that someone hastily painted on wood and wired to the fence. It said: "We won the war, now what do we do with all the planes?" That is the idea behind Air Combat Command: To do something with the bases and all the planes.

It is the goal of the Pentagon to cut back its forces yet maintain a strong national defense and U.S. influence on the rest of the world. By consolidating and trimming the fat, the Pentagon hopes to have a meaner, yet leaner fighting force that is ready at a moment's notice to respond to the military needs of the nation.

As it states in the Air Combat Command's press release:

The Cold War has been replaced by a new paradigm in which the United States is the only remaining super-power in all the elements of national power—economic, political, social, technological and military. In this new world, we must be prepared to exert America's influence in any region of the globe. The Air Force recognized this nearly two years ago and altered its central focus to a Global Power/Global Reach perspective.

World events were not the only impetus for change. Lessons learned from Desert Storm demonstrated the traditional distinctive lines between strategic and tactical war fighting capability were dissolving. Likewise the reality of a shrinking defense budget meant we would have to streamline and become more efficient in the way we do business.

That is the philosophy behind Air Combat Command. In reality, it means bases will be closing and established units will be consolidated together at fewer yet larger bases. It also means cutbacks in the size of the armed forces and also the size of reserve forces. For a complete list of what those changes are see the accompanying table.

It also means that there are big changes coming in the command, control, and (of major interest to monitors) the communications chains of the U.S. Military. The changes are already evident but will take some time for monitors to dissect, chart and figure out. However, monitors have reported some of these changes to the Federal File. The new primary night frequency for Air Combat Command seems to be 6.738 MHz. The new primary daytime frequency hasn't been discovered as of this writing.

As most monitors know from monitoring the old SAC and GCCS frequencies, there was what was known as the Alpha Monitor—the controlling station in charge of making phone patches, broadcasting Skyking and Skybird messages and the cryptic Emergency Action Messages (EAMs). The Alpha Monitor was usually identified by a one-word call sign such as INFLUENCE. On the new ACC system, the Alpha Monitor identifies itself by the Air Force Base from which the transmissions are originating from.

For example, monitors have reported messages like "OFFUTT, OFFUTT standing by for traffic" and "This is MCCLELLAN," with an all frequency request. OFFUTT is obviously Offutt AFB, Nebraska, and MCCLELLAN is McClellan AFB, California. This is good news

for military monitors and helps enormously with figuring out radio wave propagation and also in QSLing military stations.

It is apparent that the U.S. Military communications system is going through some massive changes. How this effects monitoring is not yet known. Military monitors have their work cut out for them in trying to figure out how the new system works, but it is apparent it will take some hard work and many hours of dedicated listening. That is, if you want to call that work. I think twiddling the dials in search of secret frequencies is half the fun. The Federal File needs your help in exploring this new system. When all the changes are known, be assured the Federal File will report them to you.

MAILBAG

Melrose Monitor

The Federal File received a nice letter from Dene Helwig, a municipal judge who lives in the New Mexico town of Melrose. As readers will recall, last month the author ran a profile on the Melrose Bombing Range and had the distinct privilege of being buzzed by a couple of F-111 Aardvarks there. Dene says he knows the area well, having worked at the range when he was in the Air Force and at nearby Cannon AFB when he worked for Tucson Mobile Phone Inc. (repairing the radio equipment at the base). Dene promises us a complete list of military frequencies used in the Melrose area in the near future.

Secret Frequencies

From Albuquerque comes a list of secret frequencies that the sender says are in great need of active monitoring now!

CIA Case Files

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This is an abbreviated list because many of the frequencies have been published in the Federal File before.

Nellis AFB, MOAs

Dreamland Base: 255.800 MHz

Sally Corridor: 343.000 MHz

Groom Lake Approach: 361.300 MHz

Watertown Strip (Area S-4): 297.650 MHz

Edwards AFB, Calif.

Tower: 269.900 MHz

Command Post: 304.000 MHz

Ground Control: 121.800 MHz

Approach: 318.100 MHz

Other frequencies of interest

Holloman AFB, New Mexico

397.900, 353.600, 364.200, 376.100, 251.100

Reswell Air Field, New Mexico

259.200, 305.600, 348.700

Holloman HF link: 9.023 MHz (NORAD

Southwest Region-editor)

SATCOM links: 262.925 MHz (uplink)

297.525 MHz (downlink)

Codenames and Candidates

Several readers sent in lists of the presidential candidates' radio call signs as issued by the Secret Service. They are as follows:

Pat Buchanan Cardinal

Paul Tsongas Falcon

Bill Clinton Eagle

Bob Kerry Lighthouse

No code name is yet known for billionaire candidate Ross Perot.

MT

ARINC: Worldwide Communications on a Grand Scale

Welcome Aboard

Two months ago, we updated our list of ARINC's frequencies. Now, as a supplement to those listings, here is an overview of ARINC's air/ground operations and procedures. Again, a big thank you to Dick Covell, ARINC's Air/Ground Operations Manager for his assistance.

ARINC (Aeronautical Radio, Inc.) was organized as a corporation in 1929. The scheduled airlines of the United States are the principal customers and stockholders. Nonetheless, since its beginning, ARINC services have been extended to all aircraft operators, large or small, U.S. or non-U.S., scheduled and supplemental, business, private and government. All are served on a not-for-profit basis with charges for service based on "cost in proportion to use." Today, ARINC and the airlines operate one of the largest non-government communications systems in the world.

ARINC Calling

ARINC's Selcal (Selective Calling) Service is a signaling method to alert an aircraft that a ground station wishes to communicate with it. SELCAL signals are capable of being transmitted over HF and VHF radio telephone channels. The Selcal transmission consists of a combination of four preselected audio tones, which are generated in the ARINC Communications Center tone sender and are received by a decoder connected to the audio output of the aircraft receiver (see diagram).

Receipt of the assigned tone code activates a cockpit call system in the form of a light, chime signals, or both. When a SELCAL check is requested, the pilot will spell out the aircraft unit's SELCAL code using the international phonetic alphabet.

International HF Radio Procedures

(for the frequencies assigned to these areas, see the June issue or send \$2 along with an SASE to MT for a reprint)

NORTH ATLANTIC: Aircraft operating over the North Atlantic (NAT) Ocean on routes within the New York and Miami Flight Information Regions (FIR) will be under the radio guard of the ARINC New York Communications Center. Communications concerning air traffic control and company communications in these areas are to be conducted on the NAT Family A and E MWARA (Major World Air Route Areas) high frequencies.

An additional notation states it is mandatory to have HF radio equipment installed and opera-

tional in aircraft operating anywhere in the New York oceanic FIR air space. This includes the oceanic airspace between the United States and Bermuda.

CARIBBEAN: Flights operating to and from the Caribbean (CAR) and over the Gulf of Mexico are under the radio guard of the New York ARINC Communication Center while operating within the New York, Miami, and Houston FIRS. The Caribbean Family A MWARA high frequencies will be used when beyond the range of VHF facilities while operating in these FIRS.

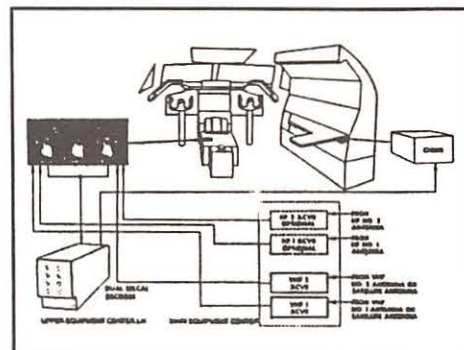
CANADIAN: Flights which operate over the Canadian Maritime Region and then via oceanic routes to Europe will be in direct contact with, and under the control of, Canadian domestic ARTCCs until leaving the North American coastline. From that point, they will be under radio guard of the Canadian aeronautical station at Gander, Newfoundland (Gander Radio).

Aircraft operators who desire to have their A/G messages relayed to their company offices may make prior arrangements with Gander Radio for this service. Flight crews may also transmit "company" information to ARINC New York via the ARINC VHF network covering the Canadian Maritime Region that operates on 129.900 MHz: ARINC LDOC (Long Distance Operational Control) frequencies may be used for company messages while on oceanic routes.

PACIFIC: Aircraft operating in the Pacific Ocean area on routes within the Oakland FIR—between the U.S. West Coast, Honolulu, and south on routes toward Tahiti—will be under radio guard of the ARINC Honolulu or San Francisco Communications Centers. Air/ground radio coverage in this area is provided on the Central East Pacific (CEP) HF family of frequencies.

Aircraft operating on routes within the Oakland FIR in the South Pacific (SP), Central West Pacific (SWP), and North Pacific (NP) regions, and within the Anchorage Oceanic FIR in the North Pacific on routes between Anchorage and Tokyo, will be under radio guard of the Honolulu ARINC Communications Center.

HF radio checks are to be made with the appropriate ARINC Communication Center prior to departure or while airborne approaching the coastline, prior to entering U.S. oceanic airspace. An HF ramp check at selected airports may be arranged by calling the ARINC Communication Center on its international VHF network or the San Francisco Center on a domestic VHF network. The operator responding to the call will provide the appropriate HF frequency for the HF communication check.



The selective-calling equipment on the Boeing 747.

Public correspondence (personal message traffic) to and from passengers (or crew members) is not permitted on aeronautical mobile frequencies.

The Domestic Service

The Domestic Air/Ground Voice Service comprises a nationwide system of more than 4,800 VHF ground radio stations which provide the voice communication channels through which aircraft communicate with their operations offices. More than 160 of these stations within the 48 contiguous United States are interconnected into networks by thousands of miles of telephone lines. These networks are controlled from the San Francisco ARINC Communications Center.

ARINC radio operators do not "guard" each network. Instead, calls are switched to a radio operator through the ARINC Call Distribution and Control System (also known as CDCS), which provides for automatic call switching of radio signals to an operator position not automatically connected to a network. The CDCS enables a limited number of radio operators to control all of the 15 VHF nets at the SF Communications Center! For this reason, it is very necessary for flight crews to provide ample time (30 seconds or more) for their initial call on a VHF network to be answered.

So, in a nutshell, the foregoing has been a look at some of the aspects of ARINC's air/ground/air communications services. ARINC is also involved in providing other services and facilities for airlines and related aviation industries, but we'll save those for another time.

Hot Off the Press!

The 1992 edition of the *World Air Carrier Radio Callsign Directory*, compiled by Bill Battles, is now available. Containing over 90 pages of information covering many facets of our aero monitoring hobby, it's one of the easiest to use and most comprehensive handbooks this

writer has reviewed in a long time. Dedicated aero monitors will really find this a welcome and useful addition to their listening posts! In addition to a large airline listing which takes a lot of the guesswork out of deciphering air carrier code names, you'll find 30 pages of callsigns, world aircraft registration country codes, mach speeds, airline company ops, addresses of airline companies (worth its weight in gold by itself!), how to get QSLs, terms and abbreviations, a list of suppliers of books, charts and radios, a section decoding the commonly heard transmissions, listings and frequencies of all English speaking LDOC stations using HF, and much more. By the way, many new frequencies found in the book have not been listed in other sources!

To obtain your copy of the *World Air Carrier Radio Callsign Directory*, send a check or money order for \$22.00 in U.S. funds (postpaid in the continental U.S.—add \$4.50 S&H for overseas orders) to:

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Readers Corner

We've said it before and we'll say it again: You just never know what you're going to hear next when you monitor the aero bands. Take the following two stories for instance...

• Roger West (Amery, WI) tells us that he recently monitored a transmission of a Cessna 310 twin engine aircraft pilot having trouble with his nose gear. He declared an emergency on 121.500, stating that he was going to land at Lakeville, MN, Airpark Airport. Since his nose gear wouldn't lock into place, he was instructed to circle the Lakeville Airpark while another aircraft was sent up to check out the landing gear while the pilot of the disabled plane raised and lowered the faulty nose gear in hopes that it would lock into place. It was finally decided to have the pilot keep circling to use up as much fuel as possible.

In the meantime, local emergency equipment was dispatched to the airfield to be ready in case of an accident. After several hours of circling the field the decision was made to try a landing. The pilot set the plane down without incident—he and his passenger emerging from the aircraft unscathed!

On the 6 pm news later that day, film footage was shown of the landing. Roger reports that when the pilot touched down, you could see the landing gear holding up for at least the first 100 feet or so of the landing.

Incidentally, for those of you in the New England area, Roger contributes these UHF air-to-air refueling frequencies over the state of Maine:

ROUTE	FREQ.	BACKUP	ENTRY	EXIT
AR206L	235.100	282.700	335.500	307.800

AR206H	348.900	282.700	284.600	354.100
AR205	327.600	282.700	319.100	380.300
AR212	238.900	282.700	282.200	346.400

• Plane Talk's Australian correspondent, Bob Bell, writes "On the Airbands" for a magazine called *Australian Aviation*. Bob tells us that one of his readers, who was out watching aircraft at a local airport while listening to his scanner at the same time, monitored the following: A pilot's voice came over the scanner announcing that an Ansett Airlines 727 was going to be performing some touch-and-go landings for pilot training.

The 727 came in for what appeared to be a normal approach, but hit the runway with a very solid thump and a good deal of smoke from the tires. Suddenly the engines were placed in reverse thrust and the brakes applied heavily. The aircraft came to a full stop in the middle of the runway and for what seemed like an eternity no doubt to the poor ruffled soul in the left hand seat, there was complete silence on the radio.

Then the same voice as before spoke again and said simply, "We shall now try that again but this time with a real pilot!" The aircraft then backtracked to the threshold and took off, did one textbook touch-and-go, and then disappeared into the wild blue yonder.

Bob's contributor said he can still imagine the red face and sandblasted ears of the trainee attempting the touch and go, and often wonders if he ever got to try that again and if indeed he is still flying!

• Gordon Levine (Anaheim, CA) recently received a prepared QSL card from "Mozambique #634" (Lineas Aereas De Mozambique). Gordon monitored the flight over the capital city of the Central African Republic, while the pilot was working Springbok Radio (Johannesburg, SA) at the time. Also, Stockholm Radio sent him a prepared card, their own QSL, a large picture postcard, letter and decals. Other prepared cards added to his collection within the past few months include those sent from UPS 2903, United 805, Qantas #26, and Air New Zealand #18.

Gordon also contributed the following ARINC frequencies I inadvertently left out in June: Central West Pacific 1&2—21985 and North Pacific 2&3—5667. He received these from a pilot!

Frank Morales (Flagstaff, AZ) says that Dragon Air—the Hong Kong LDOC facility—utilizes the following frequencies: 3007, 6637, 8921, 13333, 17940 and 21970. These are all confirmed!

Thanks to Roger, Bob, Gordon and Frank for their contributions! That's all for now. Next time, we'll talk about ACARS, transponders, position reports, and other subjects. Hoping to see all of you at MT's convention in Atlanta this October. Until then, 73 and out.

MT

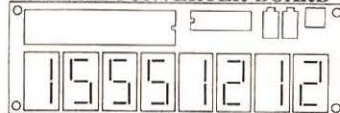
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Your News and Views

I'm going to depart from the usual fare this month to sort out the mailbag and bring some of your news to the forefront. I'll also explore some of the newest signals on the longwaves and, as always, provide lots of frequencies to listen to.

Newsworthy Lower

In addition to our reports here in *MT*, Howard "Mort" Mortimer (Baldwinsville, NY) got some recent press in the *Syracuse Herald American* Ham Radio column. Columnist Vivian Douglas reported on Mort's 1 watt lower beacon and encouraged readers to send reception reports. This is the first ever newspaper coverage of a lower station that I'm aware of and it certainly made for some good publicity within the ham radio crowd.

Mort's beacon "ZWI" continues to operate at this writing on 178.6 kHz. If you can hear it, send your reception reports to him directly at: 7614 Old Homestead Drive, Baldwinsville, NY 13027.

Longwave Lifesaver

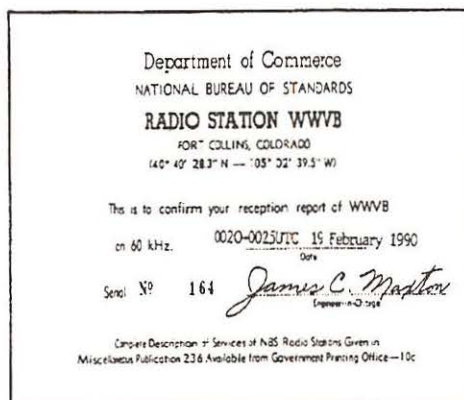
I know it's a bit early to be thinking about snow, but Bob Fraser (Cohasset, MA) sent along an interesting clipping from the *Appalachia Bulletin* about a new type of beacon that can save a hiker's life. According to the article by "Tools & Trappings" guest editor, Chris Mahoney, this new miniature beacon operates on 475 kHz and replaces older beacons that use 2275 Hz. The older system will become obsolete in 1996.

In the event of an avalanche, a trapped hiker can activate the beacon which emits signals audible to properly equipped searchers. The 475 kHz frequency was chosen in part because of its improved range and ability to penetrate easily through deep snow. Research shows that wearing a beacon increases your odds of avalanche survival by 25 to 35 percent. Not exactly great odds, but every bit helps in a crisis situation.

Out of Range

Even though the title of this column is "Below 500 kHz," a higher frequency logging crosses my desk from time to time that just doesn't seem to fit elsewhere.

Bob Combs (Tome, NM) was exploring the frequencies just above the AM broadcast band when he pulled in experimental beacon "TI" (Kingman, AZ) on 1631 kHz. I was able to supply him with an address for the station and he sent a reception report off to the operator. In turn he received a batch of station photos and a personal letter.



Bob Combs (NM) shares this QSL from radio station WWVB.

Beacons operating in this range are called "MEDFERS"—an acronym for Medium Frequency Experimental Radio Station. Part 15 of the FCC rules allow license-free operation there under conditions similar but more restrictive than the 160-190 kHz lower band. Medfer power output is limited to 100 mW and the antenna length must not exceed 10 feet.

In his letter to *MT*, Bob also included QSL cards from some of his favorite LF intercepts including several European broadcasters and one from time station WWVB (60 kHz) in Fort Collins, Colorado. Each card from WWVB carries a serial number and he was the lucky recipient of card #164.

Beacon Updates

Since 1987 the Coast Guard has been re-vamping and streamlining its system of beacons under the Radiobeacon Modernization Plan. Under the plan, sequenced beacons are being converted to continuous operation, some beacons are being relocated to more accessible sites, and power levels are being adjusted to provide the necessary coverage. The ultimate goal of the plan is to provide a more reliable, cost effective network of beacons.

The Great Lakes region has completed its work under the plan and efforts are now focused on the East Coast and Gulf of Mexico. Bob Fraser (MA) supplies these changes from the USCG Local Notice to Mariners (First District): "MI"—Manana Island, ME (286 kHz) will be changed from sequenced to continuous operation on 305 kHz with a power reduction, "NCE"—Portsmouth Light, NH (322 kHz) will

change to 288 kHz with a power increase, and "HR"—Halfway Rock Light, ME (291 kHz) will be discontinued.

Though radiobeacons are one of the oldest means of electronic navigation, they are now being called upon to support an ultra-modern satellite-based Navaid called the Global Positioning System (GPS). Selected beacons have been retrofitted with equipment to transmit GPS correction signals along with their usual ID.

If you hear a slight warble on the ID tone of a beacon, it may be due to the transmission of GPS data. According to the Coast Guard, there are only a few beacons with GPS equipment right now. But if it works out well, the program may be greatly expanded.

Dog Day Tuning

Summertime can yield some of the best listening for maritime traffic on the longwaves. You may want to check out these frequencies when you're looking for a change of pace from the beacon game: 448 kHz (WX and Safety Bulletins), 518 kHz (Navtex), 500 kHz (Distress and Calling) and 512 kHz (Calling).

Henry Brown (Falmouth, MA) passed along news of a new 50 kW Navy communications station that has been established on 119.85 kHz in Dixon, CA. After initial tests, the station is only expected to be on the air as required. I have no further information at this writing and would appreciate any reports of hearing it on the air.

End Notes

Amidst the static and generally weaker signals of summer, sometimes the best thing you can do is find some good radio swap meets to attend. Between the unbeatable deals and the camaraderie of fellow hobbyists, you're sure to enjoy the day.

At this year's Rochester Hamfest, I had the pleasure of meeting several longwave enthusiasts in person. Many of these folks are also devoted readers of "Below 500 kHz." It was the second year in a row that I've met some of them and the group grew considerably over last year. My thanks to these readers and others who stopped by to say hello: Chet Koziol (lower "IH"), Ernie Lawrence, Jack Roubie (K2JDD), Howard "Mort" Mortimer (lower "ZWI"), Jim Wilson, Don Moth (W2MPK), Jim Keller (N2LQQ) and Nick Dudish (WB2FAW).

'Til next month, happy DXing!

MT

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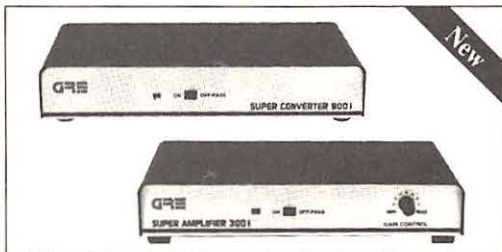
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For several years WHVW, in Hyde Park, New York, had been floundering and searching for an identity. It was quite successful in the 1960s with a top 40 format, but times changed. To regain the huge audience it once enjoyed, management tried everything: nostalgia and big band music, news, talk, and two versions of satellite delivered oldies. Nothing seemed to click. It was time to sell the station and move on.

After several months of negotiations, WHVW was transferred to J.P. Ferraro, a seasoned broadcaster and engineer from Yonkers. J.P. had worked all over the New York metropolitan area and was ready to spread his wings. WHVW seemed like the perfect situation.

J.P. had a love for "good old AM radio" and WHVW needed his expertise. Using a single 249 foot tower with a brand new ground system, WHVW's 500 watts covers most of the Hudson River Valley with a solid signal on 950 kilocycles. Even though the station is required to reduce its power at night to 57 watts, the signal remains quite penetrating.

During his first few weeks of ownership, J.P. and his long-time friend, Allan Weiner, swept out a lot of cobwebs both literally and figuratively. WHVW was using a satellite-delivered rock oldies format garnering little audience response. The station had fallen into disrepair, operating costs had gone through the roof and big changes needed to be made.

Almost overnight, WHVW was revived into a lean new challenger in the Poughkeepsie radio market. The area is saturated with radio stations presenting every format imaginable. "To make AM radio stations successful, you have to find



J.P. greets the Hudson Valley every weekday afternoon on WHVW.

AM Radio Is Not Dead!

Alan Weiner poses next to WHVW's prize possession — their Collins 20C transmitter.



your niche," muses Al Weiner. "This station has been looking for an identity for years. AM radio is not dead. It may be a little tougher to succeed, but it can be done. People don't listen to AM radio because there's nothing to listen to."

After carefully studying what was already on the air in the area, Allan and J.P. agreed that a country format would be their best shot. A satellite delivered format would be cost efficient and allow 24 hour a day operation with a minimum of employees. "We couldn't spend a dime more than we had to," says J.P. On a sunny Sunday last May, Allan and J.P. moved their dish, tuned up their satellite receiver and made the switch to Satellite Music Network's Traditional Real Country format.

Real Country is a blend of old standards with the work of new traditional artists. Country rock crossover songs are avoided. You'll hear Patsy Cline, George Jones and Tammy Wynette records mixed with newcomers like George Strait, Randy Travis and Reba McEntire. "People are so appreciative to have this kind of music on the air. The listeners constantly call just to say 'thank you'," Allan notes. WHVW salesperson Joel Andrews loves the change, too. He's never seen such a positive reaction to a format change during his 40 years in radio ad sales.

WHVW doesn't depend solely on satellite delivered programming for their air sound. Live disk jockeys play music and report local news during morning and evening drivetimes and middays. J.P. mans the microphones every afternoon himself!

"If you bring us your old country records that are collecting dust in your basements or attics, we'll bring them back to life and share them with the entire Hudson Valley," J.P. men-

tioned over the air one afternoon. Soon WHVW's reception area had become stacked with piles of records by Grandpa Jones, Willie Nelson, Hank Snow, and hundreds of other classic country acts.

"We've never gotten a call from a listener complaining that our station is on AM. People don't seem to care if you broadcast on AM or FM. If they like what you're playing, they'll listen. A lot of people have forgotten the AM band. It's really exciting and fun. And one thing makes it special: you still can go to Radio Shack and for five bucks get something that'll pick us up!" Allan cheers.

Simplicity is paramount at the WHVW studios. A spartan control room feeds a CCA 500 watt transmitter. Their signals emit from a single vertical antenna in their beautiful backyard overlooking the Hudson Valley. The backup transmitter is a classic Collins 20C with four stately 833 tubes glowing through the glass front panel. Two satellite dishes are mounted beside the station. One receives the music service originating in Phoenix, Arizona, and the second delivers Mutual Radio Network news from Washington, D.C.

Operating costs are kept very low by a variety of trade agreements with local businesses. Almost all the services required by WHVW are supplied free in exchange for free radio advertising. Office services, food, exterminators, painters, trash removal—even eye glasses—all are traded for on-air announcements.

Sundays on WHVW are reserved for specialty programs. You'll hear shows produced by local residents for the Irish, Polish, and Italian communities, and Sunday evenings WHVW

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features classical music. Listeners to these shows are even more loyal and dedicated than hard core country music fans. Weekdays at 5:30pm, the audio portion of local independent television station WTZA's newscast is simulcasted on WHVW giving both stations a boost.

A backyard country music barbecue is planned for this month. WHVW hasn't had so much excitement since it first hit the air on July 4, 1963. J.P. wants everyone to "Tune in the sounds of WHVW on 950 crispy kilocycles!" It's time to reacquire yourselves with AM radio!

Mailbag

Stanislav Mekhonoshin lives in Perm, a small metropolis just west of the Ural Mountains, filled with stately architecture and tree-lined boulevards. Four Russian speaking services and two local language stations serve his home town. Dominating the dials is Radio Rossi, "a republican programme in the Russian language," satellite delivered to the entire country. It's a combination of a network broadcast from Moscow with regional programming for a specific area. On 585 and 1512 kHz, Radio Rossi shares time with Perm Radio. Tune to 1458 in Kudymkar, or 1602 kHz from Gaiy, to hear Radio Rossi combined with Kudymkar Radio broadcasting in the Komi language. Radio Rossi combines with Kazan Radio in the Tatar language on 7185 and 15200 kHz shortwave from Perm. Radio Orbita-4, a Russian service from Moscow for the Ural area, shares 6165 and 11770 kHz with Perm Radio and Kudymkar Radio.

Perm's most powerful transmitter can be found on 1359 kHz providing local service of Mayak, a Russian term meaning "lighthouse." 50 kilowatts radiating from a 120 meter tower ("vertical vibrator") creates a penetrating signal, with a variety of music 24 hours a day. News updates are heard every half-hour, and play-by-plays of major sporting events fill out their broadcast day. Mayak can also be heard on a 1 kilowatt repeater in Oktiabrsky on 1485 kHz.

A new commercial station, Radio Maximum, operates daily on 846 kHz and 66.81 MHz in stereo with a mix of news, music, and commercials that mimics American radio stations. Maximum was founded by a consortium of The Harris Corporation, Westwood One, and Story First from America, and the Soviet newspaper Moscow News, according to Stan. The service plans to expand to the cities of Ekaterinburg, Kiev, Minsk, St. Petersburg, and Alma Ata in the near future. Thanks, Stan, for an interesting "radiologue!"

New Station Grants

Where are the latest additions to the Ameri-

can broadcast bands? Right here! Greenfield, CA 88.5; Fenwick Island, DE 92.1; Ormond-by-the-Sea, FL 95.7; Roswell, GA 107.5; Fort Kent, ME 106.5; Asbury, MO 103.5; Clovis, NM 102.3; Texico, NM 96.5; Warsaw, NY 88.3; Semora, NC 106.7; Del City, OK 91.7; Cookeville, TN 90.9 and Amarillo, TX 96.9. Courtesy of *The M Street Journal*.

For Sale

Get out your thick wool sweaters and your mukluks! Two sister stations are being offered as a package in Alaska. This 10,000 watt AM and 29,000 watt FM are now rated number one in their market, with an excellent cash flow. Both outlets serve a population of 85,000, and it's growing fast! Call B.G. Olson at 907-474-0664 for details.

Looking for a powerful signal in beautiful Eastern Montana? A full-powered 100 kilowatt Class C station is being offered for \$395,000. This station covers a good portion of the state, with top audience numbers, and features mint condition equipment. Interested? Call Paul at 612-222-5555.

International Bandscan

Seasoned DXer and world traveller Alain Pepin has discovered the correlation between Cuban call letters and transmitter locations, while deep sea diving off Fidel's island. Alain noted each station uses a three letter prefix indicating the city of operation, followed by a final letter as an ID for the specific station. Here's how the cities are assigned: CMA Pinar del Rio, CMB and CMC Havana, CMG Matanzas, CMH Las Villas, CMF and CMJ Camaguey, and CMD and CMK in Oriente. For example, CMAN are the call letters for the Radio Rebelde outlet in Pinar del Rio on 550 kHz. Two three letter call signs were found: CMQ Arroyo Arenas, and CMW La Julia, both Radio Rebelde outlets.

Even if you don't speak Spanish like Alain, you can still log Cuban stations using Morse code IDs! Listen for a Spanish-speaking announcer with a clock ticking constantly behind him. You'll also hear a distinctive "RR" in Morse code every minute at zero seconds. This is the Cuban all news radio network called Radio Reloj (Clock Radio). Look for them on 590,760, and 790 kHz and many other frequencies.

Alain authors the broadcast band DX column for the Canadian International DX Club's "CIDX Messenger." For more information about CIDX write to: 61-52152 Range Road 210, Sherwood Park, AB T8G 1A5 Canada today! Until next month, happy trails!

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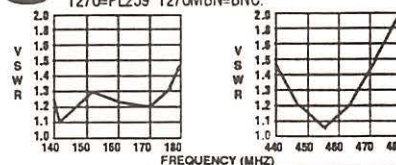
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\$23.95 MODEL # T270M
MODEL # T270MBN
SPECIFICATIONS

The T270M and T270MBN mobile dualband magnetic mount antenna kits are designed to provide years of satisfactory operation. They bring dual band operation to discriminating users of both amateur and commercial equipment. These antennas are designed to enhance the capabilities of portable equipment. The heavy duty magnet insures reliable operation at speeds up to 100 M.P.H. The base comes with a protective mylar to prevent damage to any mounting surface. These antennas are supplied with 12' of RG58A/U coax and a choice of connector T270-PL259 T270MBN-BNC.



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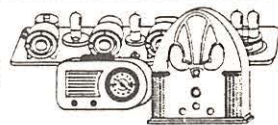
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Educational Television in Nebraska

One of the often over-looked channels available to the satellite TV audience provides an excellent study of the capabilities of satellite delivery and a glimpse into the potential future of over-the-air broadcasting.

The Nebraska ETV Network resides on a 72 MHz wide C-band channel on Spacenet 3 (87 degrees W). The purpose of the channel is the distribution of the Public Broadcasting Service (PBS) and locally originated programming to affiliated stations throughout the state. NETV uses the 72 MHz transponder split into two 36 MHz wide channels. The channels show up on satellite receivers as channels 2 and 4 respectively. On channel 2, NETV operates its PBS line-up and on 4 it operates Schools Telelearning Service (STS) which is a state-wide interactive learning channel operated during school hours.

Audio Subcarriers

In addition to the two video channels, NETV also operates several audio subcarriers. On channel 2, video program audio is found in discrete stereo on 6.12 and 6.30 MHz. Monaural audio is on 6.80. Another subcarrier is KUCV-FM, the Lincoln National Public Radio affiliate which is also in discrete stereo at 5.76 and 5.94 MHz. And, finally, NETV uplinks the Radio Talking Book Network, a Nebraska newspaper and book reading service for the sight impaired. This audio is in mono on 6.46 MHz.

Real Promise

In the era before satellites, such intrastate networks were done either via landline (the phone company) or by point-to-point microwave relay. Either way was very expensive and provided little flexibility. Among the promises given by satellite has been the ability to blanket the entire region with a broadcast quality signal at one low price. This coverage means that local affiliates can be located anywhere within the reception area. Network expenses at the local retransmission site are limited to simple downlink TVRO units.

But the beauty of such a system lies in the flexibility within the network transmission. Satellite delivery allows for not just video and

program audio but many audio subcarriers and even data transmissions via the Vertical Blank Interval (VBI).

Audience Advantages

The name of the game in all broadcasting is increased audience. For commercial broadcasters a bigger market means increased commercial rates. For the non-commercial broadcaster a wider audience means increased revenues at pledge time. If the ratio of increased pledges to cost of achieving the audience is high enough, it can be considered a ripping success.

But that's not all. With its signal available via satellite, local cable companies around the state with poor signal coverage from over-the-air stations can still make NETV available to subscribers thus adding even more potential pledges. And finally, there's the state-wide satellite dish population which finds itself in the same position as the cable companies, too far away from terrestrial TV reception but with a desire for at least state if not local programming.

The Future

States which are considering expansion of existing ETV operations, or institutions such as universities with decent funding for ETV projects, would do well to consider the NETV example. A combination of events is leading to an even more favorable climate for such activities. There are many C & Ku band channels currently available which usually means a buyers market. In addition, the TVRO industry has settled down to the point where reliable, inexpensive receivers and related equipment are widely available. New satellites now being readied for launch will have even more channel space and higher power making transponder space and TVRO gear cheaper yet!

Transponder Notes

In July, PBS began transmissions on Spacenet 4 (101 degrees W) as follows: Channels 6, 10, and 12 for schedules B, C and D respectively. PBS will apparently maintain

Spacenet 1 channel 23 for schedule A. All channels maintain the same audio frequencies which are: 6.80 MHz for mono, 5.65 and 6.20 matrix stereo and 5.20 MHz Spanish language.

New satellites and their expected launch dates are being watched closely. GE Americom's Satcom C3 will replace FIR at 131 degrees W. Look for C3's launch in early September. Its 24 channels will feature 17 watts output.

GE Americom's Satcom C4 will replace Satcom F4 and reside at 135 degrees W. Scheduled for launch this month, C4 will feature 24 17-watt channels.

Hughes' Galaxy 1R will replace cable workhorse G1 again this month and will have 24 16-watt transponders.

Galaxy 4 (slated for 99 degrees W) is another from the Hughes stable. It will feature 24 C-band and 24 Ku-band channels of 16 and 50 watts respectively. Launch is expected to be in December of this year. National Public Radio (NPR) will move its SCPC delivered services from its current location on Galaxy 6 to Galaxy 4.

Meanwhile, Galaxy 7 is scheduled for an October launch to reside at 91 degrees W. As with its sister, G4, G7 will have 24 C-band and 24 Ku-band channels of 16 and 50 watts.

This represents the biggest shuffle of satellites and programmers in the history of the Clarke Belt. Once in place, these changes should remain for 12 to 15 years. This entire procedure, assuming good luck with launch vehicles and satellite hardware, will tighten up the satellite spacing in the Belt and provide for much better signals to TVRO installations.

Change of Venue

SCOLA is now found on Spacenet 1 Channel 24. Program audio is usually found on 6.80 MHz. An English translation of program material can be found on 6.20 MHz.

Midwest Sports Channel is now found on ABC 1 (128 degrees W) channel 22. WCCO-AM, a news-talk format station from Minneapolis-St. Paul, MN, is found at 6.20 MHz on this same channel.

Letters

• Jack Nibecker of San Diego, CA, has enjoyed listening to AFRTS broadcasts and laments their disappearance from the airwaves. He also enclosed a Fact Sheet published by AFRTS, dated January 1989, describing how to receive AFRTS programming via INMARSAT. According to the world map on this information sheet, AFRTS uplinks to the Pacific Ocean MARISAT F3 satellite at 176.5 degrees E and to the Atlantic Ocean service via MARECS B2A at 26 degrees W. AFRTS frequencies are listed as 1526.950 and 1537.00 in the L-Band.

Jack, the only INMARSAT receiving system that I know of is offered by AVCOM of Virginia, Inc., 500 Southlake Blvd., Richmond, VA 23236; phone 804-794-8284. The system includes a receiver, a one meter spun aluminum dish with azimuth/elevation mount and tripod, and an INMARSAT adapted feed with low noise amplifier (LNA). This unit, and I suspect any similarly manufactured system, is not cheap; expect to pay in the neighborhood of \$2,500 to \$3,000.

There are alternatives. AFRTS is listed in the latest WestSat Communications Satellite Channel Chart as having two SCPC frequencies on GE's Satcom C5 (139 degrees W). This is a C-band satellite which should be viewable from the West Coast using a normal C-band TVRO antenna and receiver. To receive the SCPC channel, an additional SCPC receiver such as the Heil SC-1 would be required for reception. The upshot is that an entire C-band system complete with SCPC receiver would cost less than the limited use L-band system.

• Speaking of SCPC receivers, readers of last month's column were told I would review the new SCPC-100 from Universal Electronics. Unfortunately, a review receiver was not made available by press time. It is hoped that one will be received for the September MT.

• Pssst. Wanna make a quick killing in broadcasting? With pitches barely more sophisticated than this, "boiler-room" scammers are appealing to the avarice within us all to get in on the last great radio spectrum give-away. Whether it's the Low Power TV (LPTV) license rush or a chance to get the latest TV related interactive franchise or Multi-channel Multi-point Distribution Service (MMDS) awarded in your market, you have an opportunity to make a lot of money.

"Investors" are urged to plop down \$2,500 to over \$10,000 to reserve a place in line for the big pay-off when the FCC or some other official organization dispenses the licenses for you to print money. In the case of MMDS franchises, companies known as application mills take the money, file an application and wait for the lottery. According to industry sources, over 11,000 such NHDS applications were made last

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year with an estimated 90 percent being from such scammers.

To avoid losing your life's savings in such flim-flams follow these tips: Don't make business deals over the phone with salesmen. If you really have a hankering for investing in broadcast related industries, seek the advice of a competent licensed financial advisor. Study the aspects of the medium in which you are interested. Read the trade journals, books and learn to read a stock prospectus. Making money is never as easy as the ads would have you believe. Be skeptical.

Hedging Their Bets Department

Remember all the fuss about the great High Definition TV (HDTV) competition? Here was the great American process: Companies involved in state-of-the-art electronics, backed by well-heeled financiers, would battle it out in the lab for technical supremacy. The FCC would be the judge, and we'd all get the best product available.

The companies on the losing side of the FCC decision could stand to be seriously hurt, however. Among the competitors were two teams: General Instrument/M.I.T. and Zenith/AT&T. Now comes a statement from the four of them agreeing that "...if any of their entries is selected by the FCC, they would share future royalty income." They also agreed "...that they would work with each other, as appropriate, to enhance the system selected as the standard by the FCC to assure the best technology for the country."

More Bad News for Cable

Just when the cable industry was planning the funeral for "free TV," the Zenith-AT&T

digital HDTV team has been experimenting with its system to broadcast HDTV signals in the over-the-air environment at a relatively long distance.

In a late night experiment, Zenith and AT&T conducted a broadcast from WMVT-TV in Milwaukee for reception at the Zenith technical center in Glenview, IL, some 75 miles away. The conventional "analog" signal from WMVT at that distance is virtually unwatchable.

However, using less than 1/10th of the power used to transmit a full-power conventional analog TV signal, Zenith and AT&T successfully transmitted and received digital signals—without noise, snow or ghosts. This in spite of another analog TV station on the same channel less than 10 miles away from the receiving station.

The transmission was made using Zenith-AT&T compression/decompression technology and the TV station's own existing transmitter, tower and antenna.

Implications for the future of terrestrial broadcasting couldn't be better. With this type of HDTV transmitting technology, the thousands of vacant VHF-UHF channels which could not be used with existing transmitting methods could be assigned to transmit HDTV, premium movie channels, sports, pay-per-view and any other type of programming service currently downlinked via satellite direct to homes with simple roof-top antennas and an add-on decompression box attached to the TV.

Outmoded cable technology, with its inability to expand, unwillingness to offer choices and ham-strung by having to physically wire every house it serves, could be the endangered species instead.

MT



Cushcraft R7

A few months ago, I moved to a new home in town. The new lot is much smaller than what I have been used to and zoning restrictions make erecting a tower difficult.

Over the years, I have spent a lot of time worrying about my large beams coming down during bad weather and every advancing year makes tower climbing more of a chore. So I felt it was time to move on to a simpler, if less efficient, antenna. A 160 meter grounded loop has been doing an excellent job of snagging DX and letting me rag chew with hams all over the world; however, since this antenna is connected at four points (all of them trees) it does require a lot of maintenance.

Magazine ads touting the Cushcraft R7 vertical antenna piqued my interest, but at nearly \$400 the antenna just seemed a bit too pricey. However, several hams I had talked with were using them and spoke highly of the antenna, and the 22 foot height for seven bands was very appealing. Calling around to the various advertisers in the ham magazines I found "National Tower Company" had the best price around (their phone number is 800-762-5049). Three days later the R7 arrived.

The size of the box was not what I had expected! It was SMALL! Upon opening the box I began to realize why the antenna cost what it did. The antenna uses six linear traps to cover all of the bands from 10 through 40 meters, and the traps are superbly constructed. Considering the time and material to build the traps and the additional time to properly tune them, the pricing is understandable.

But Does it Work?

I dumped everything out on the garage floor and started connecting traps as per instructions. About an hour later I had the antenna ready to put up on the roof. Let me add here that I recommend using a 5/16th socket and ratchet wrench to tighten all of the clamps properly.

The R7 is only 22 feet long, but due to the linear method of loading, the antenna works as a half-wave antenna on all bands; resulting in an extremely low angle of radiation. In theory this equates to a good DX antenna.

All one need do to mount the antenna is to fasten a length of 1-1/4 inch diameter pipe to a convenient spot. My convenient spot was the chimney of my house. I dropped the antenna over the pipe, hooked up the coax and went down to the shack to check it out.

The SWR on ten meters was under 2:1 across the entire band, on 12 and 15 the antenna again covered the entire band. 20 meters had a 170 kHz band width from 14.0 to 14.170 (adjustable to any point in the band). On 30 meters the resonant point was 75 kHz below the band and

had to be readjusted. Upon readjustment, it was found that the antenna only had a 15 kHz band width (the problem was a faulty trap which Cushcraft replaced within two days). 40 meters has a solid 75 kHz bandwidth which is adjustable to any frequency desired simply by extending or retracting one piece of tubing.

Considering that everything fell into place (except for the 30 meter problem) using Cushcraft's measurements, I must say I am impressed!

Using the Antenna

I tied my Kenwood TS-680 to the antenna and gave it a whirl. The first QSO on 40 was with a UT5 (Ukraine); 30 meters produced a G3 (England); and 20 meters turned up a UC6 (Byelorussia). An SM (Sweden) on 17 meters said I was one of loudest signals on the band! First on 15 was a ZS3 (Namibia). 12 meters netted a PY and although 10 meters was very noisy I did manage to work a WB7 in Washington State. Considering the fact that the bands were in terrible condition, I was well pleased with my first attempts.

In two weeks of operating, stations on all continents were contacted on 20 and 15 meters. Most impressive was 40 meters where I worked several ZL and VK (New Zealand and Australia) and enjoyed good rag chews with each (one of over one hour); I missed only Asia for WAC (Worked All Continents) on 40 in a two week period! All of this with less than 100 watts.

Conclusions

Without doubt the R7 is an outstanding seven band (10-40) antenna. It is easy to install and adjust. It will work DX with the best of them and requires a minimum of space (no radials). The antenna is very unobtrusive and should not draw much comment in any neighborhood. It will work fine at any height above ground. While it does not compare with a large Yagi installed on a tall tower, it will let Mr/Ms average ham work a lot of DX and have a darn good time no matter where they live.

The R7 has very little wind load and consequently worries about the antenna falling in a wind are minimal. It is competitive and will allow a competent user to break a DX pileup. After using this antenna all my concerns about the price have disappeared; it is well worth it. For more information, write Cushcraft, P.O. Box 4680-MT, 48 Perimeter Road, Manchester, NH 03108; 603-627-7877, or see your local dealer.

Psst, wanna buy a kit?

I receive a lot of requests from readers who want to purchase a kit. The urge to build is strong

in many hams, but being able to acquire parts can be another story. There are several companies who sell kits of various types for SWL's and hams, but one that recently came into being is Townsend Electronics.

Townsend is handling the Howe line of kits produced in England and well known throughout Europe. They produce high quality kits for receivers, transceivers, amplifiers, converters and numerous other devices.

Howe's kits are very good, their parts are of better than average quality and the devices work as advertised. In the past, documentation was designed for the builder who had a fair to good background in electronics and had built other pieces of gear.

Now, Townsend is attempting to put the instruction manual into more of a Heathkit type of format to make it easier for the first time builder to successfully complete a project. Prices are in line with other high quality kits and include everything needed to complete the unit.

If you are looking for a decent rig that is fun to build, give Townsend a try. Their address is Townsend Electronics, Inc., P.O. Box 415, Piercetown, Indiana, 46562. Tell them MT sent you.

Aerials

I just received a new book titled *Aerials* by Kurt N. Sterba & Lil Paddle. This manual is loaded with good practical information about antennas. It is NOT an antenna construction manual; rather it defines the electrical properties and operating characteristics of antennas and transmission lines.

Aerials dispels a lot of nonsense about many aspects of antennas and gives the beginner a good insight into the subject. The book is of good practical value to almost any ham, but new hams especially will benefit from reading it.

Kurt N. Sterba is the pen name for a columnist of *Worldradio* magazine. I have been reading his column for many years and find it informative. In his column he frequently takes well known authors and leaders in the amateur radio world to task with cutting sarcasm and acid wit. This book is a reprint of his columns.

To be honest, while I agree with the technical aspects of the book, I do not like Sterba's style! If you disagree with something, say so up front, and give the other guy a chance to defend himself. Sterba likes to belittle and criticize others, but won't stand up and say "I said that." "Get out from behind the pseudonym, Kurt, your facts are great, the rest is bull." Ike said that!

The book costs ten dollars plus two more for shipping and handling. It is available from *Worldradio* 1-800-366-9192.

That's it for August, see ya next month. 73, Ike, N3IK

Rob Leonard's

Ham DX Tips

I hope that everyone is enjoying their summer or winter, depending upon where you may be! The "new" ham DX season is just around the corner, and now is the time to check your antenna for those upcoming contests and big DXpeditions while you still have the time and/or the weather to do so. Here are some "targets" to use in determining if your equipment is functioning as you wish.

COMORO ISLANDS D68JM has been on 21,410 kHz SSB daily at 1730 UTC. His QSL manager is: Robert D. Strathy, 5428 Brandy Cir SW, Fort Meyers, VA 33419. **EAST MALAYSIA** Another 15 meter SSB regular has been 9M8BL (Belinda Lim, 171 D Cookes Dr., 93150, Kuching, Sarawak, Malaysia) on 21245 kHz at 1500 UTC. **GUINEA BISSAU** J5UAI is still another amateur who has taken a liking to 15 meters. Plans call for him to be on assignment here 'til January 1994. A newly licensed amateur, he prefers slow CW between 21100 and 21150 kHz around 1400 UTC most days and SSB on 21325 kHz at 1530 UTC. His QSL manager is NW8F, Cecil Williams, 1883 Kittle Rd., Rt. 2, Wheelerburg, OH 45320. **JAMAICA** Those needing this country on CW should check 21025 kHz at 1800 UTC most days to find 6Y5FS. QSL to N.E. Bethune, 22 Dunbar Dr., Wood Green, London N22, England. **NETS** One way to catch DX operators from the more remote areas is by finding them in nets. DX stations appear on some nets for other purposes than to be there for you to work DX, and of course if you check in you should be able to contribute to the purpose of that net. SWLs, on the other hand, can and should find some new countries for their log books on these nets and, of course, the added benefit of learning more about some of the less traveled places on our planet. The "Disciples Amateur Radio Fellowship United Church Amateur Network" is one of several such nets. These nets exist so that members (many of whom are missionaries) can pass along messages to friends and family members as well as information to assist them in their daily activities. These various nets meet: at 1130 UTC Sundays on 14287 kHz SSB (serving the SW Pacific area); at 1200 UTC a net for Australia meets on 3560 kHz CW; at 1800 UTC on 14280 kHz the International Mission Amateur Radio Net meets with check-ins from around the world including Africa and South America; Mondays at 2200 UTC the Paraguay net meets on 21305 kHz SSB; Tuesdays and Saturdays the SW Pacific net meets on 14287 kHz at 0415 UTC; and a US net meets on the same frequency on the same days at 1430 UTC. Thanks to the DARF-UCAN for this info. **NICARAGUA** YN1CB has been on 21085 kHz RTTY at 1730 UTC (WX5L is QSL manager for this one: Randy G. Hollier, 1421 Atlanta St., Metairie, LA 70003). **PUERTO RICO** The Puerto Rico Amateur Radio League is sponsoring the "Regatta Colon 92" award to commemorate the 500th anniversary of Columbus' discovery of the Americas. To earn the award you need to log seven stations from Puerto Rico between 20 May and 20 November as follows: two special KP4 stations using /500 to end their call signs, operating from San Juan and Aguadilla, four other resident amateurs of Puerto Rico, and the special KP4 station using the /500 suffix operating from the US Coast Guard training/sailing ship "Eagle." To help you earn the award, Puerto Rican stations will be operating on the frequencies of: 3897, 7279, 14250, 2325, 28497 kHz SSB and on CW look for them on: 7040 at 0030 UTC daily for low power stations only, and on 10106, 21063 and 28063 kHz. To obtain the award, send your QSLs and a 9" x 12" SASE to RARL, Bob 1917, San Juan, PR 00919-1917. **SENEGAL** Paul Mochet, 6W6W (Hotel de Paris, Box 334, Kaolack, Senegal) has been offering this rare country to RTTY fans on 21090 kHz at 1730 UTC daily. **SOUTH GEORGIA** VP8CBK has been on the GW3CDP DX net on 21335 kHz SSB at 1500 UTC daily. CW fans can find him on either 21050 or 28050 kHz (whichever offers him the best propagation) at 1300 to 1500 UTC. QSL to his manager: K1IED, Larry F. Skilton, 72 Brook St., South Windsor, CT 06074. **TANZANIA** 5H3RA has been on 24940 to 24955 kHz SSB at 1500 UTC, and 24895 kHz CW at 1800 UTC, and 14060 kHz CW at 2330 UTC. QSL requests go to his manager: JA3PAU, M. Garl Taguchi, Box 1052, Kobe 650-91, Japan. **UK SOVEREIGN BASE AREAS ON CYPRUS** ZC4DG (whose mailing address is: D.G. Griffith, COM CEN JMU, RAF, Akrotiri, BFPO 57, London, England) has been joining the 14256 kHz DX group net at 0100 UTC most days. **USA** Even though it is August, you can still find the "All Schools Net" meeting every Thursday and Tuesday at 1630 UTC on the frequency of 28303 kHz SSB. This net is for and is by teen and pre-teen students and their teachers.

And that wraps it up for another month. Thanks to all who wrote; all the folks at MT enjoy hearing from you. 73 de Rob.

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Has Vanguard Replaced the Voice of Tomorrow?

Since 1983, the Voice of Tomorrow has been the only clandestine station that beams English language programming to North America. Although its Nazi and fascist transmissions have been irregular and pirate-like, the station has transmitted dozens of broadcasts during the last nine years on 1610, 6240, 7410, and 15040 kHz.

In May of this year, **National Vanguard Radio** suddenly appeared with a regularly scheduled UTC Sunday program on 7355 kHz between 0100-0130 via a **WRNO** relay. It quickly became evident that Vanguard is an extremely close clone of the Voice of Tomorrow. The station features startlingly frank advocacy of ultra-right wing politics, including calm but blunt attacks on blacks, Jews, and other groups not of "white European descent."

Although it does not use the howling wolf over Nazi drums interval signal featured by the V of T, Vanguard otherwise sounds like a nearly precise replica of the Voice of Tomorrow. It therefore is possible that Tomorrow has borrowed a page from the tactics used by many anti-Castro clandestines, who regularly buy relay time on licensed United States commercial shortwave broadcasters.

So far the station has been mum about possible Tomorrow-Vanguard links. It uses an address c/o National Vanguard Books, P.O. Box 90, Hillsboro, West Virginia 24946. This bookstore's catalog offers tapes of "National Alliance" Nazi speeches that have been featured on Voice of Tomorrow programs in the past. The Voice of Vanguard's booth announcer Kevin Strong sounds a lot like the announcer heard on the Voice of Tomorrow. All of this circumstantial evidence suggests that a renamed USA clandestine may be on the air.



The leftist Radio DC fights the rightist WGOP.

Clandestine Addresses

Clandestine expert Hans Johnson of Columbia, Maryland, sends in two previously obscure addresses. **Radio 16th of December**, a station with anti-Haiti programming that has bought time on **Radio Miami International**, can be contacted via Patrick Elie, Embassy of Haiti, 2311 Massachusetts Avenue NW, Washington, DC 20008. Hans received this address direct from RMI's Jeff White.

Hans also reports an indirect contact address for the Kashmir clandestine **Voice of Harriat Independent Kashmir**. Muhammad Munawar Naeem of Pakistan has managed to record an excellent quality 60 minute tape of a Harriat broadcast. Naeem offers copies of the tape to interested DXers via Government Pilot Secondary School, Wahdat Colony, Lahore 54600, Pakistan. You should enclose \$5 US to defray Naeem's postage and tape costs.

On the pirate front, Stanislav Mekhonoshin of Perm, Russia, sent in a mail drop used by three Russian pirates! **Radio Without Borders** is a pirate that uses 48 meter frequencies in the 2100-2300 range. A different station from the Crimea, **Radio Black Sea International** is supposedly scheduled on 6900 kHz on Saturdays between 1600-1800, so North American reception is out of the question. **Romantic Space Radio** is sometimes relayed by the RWB transmitter. Stan followed up his initial report with a revised address for all three: P.O. Box 29, Moscow 109444, Russia.

Just Getting Started?

Clandestine DXing can be exciting. The political intrigue of these revolutionary stations is fascinating. But, if you are a new shortwave listener, where do you start? Newcomers to DXing could check out three clandestines that can be logged by anybody with a shortwave receiver.

Robert Ross of Ontario suggests the anti-Colombian **Radio Patria Libre**, which he hears easily every evening on 15045 kHz between 0030-0115. Another good one to try for is the mysterious anti-Castro **Radio Caiman**, "Radio Alligator," which is very well heard every night for hours around 0100 on 9965 kHz. Right next to Caiman on 31 meters is the longtime anti-Castro stalwart, **La Voz del CID**, which operates an extensive schedule throughout the day on 9941.5 kHz.

CID also uses 7340 kHz in the evening, switching to 6305 kHz late at night. *MT* reader Vince Havrilko of Germany reports clear reception of both Caiman and CID from Europe, and they are also very well heard throughout North America.

Pisano Can't Pay

In last month's column we reported the FCC bust of Robert Pisano, allegedly the operator of Tampa clandestine **La Voz de la Federacion Mundial de Ex-Presos Politicos Cubanos**. A May 21 article in the *St. Petersburg Times* reported that neither Pisano nor the Federation has sufficient funds to pay the \$8,000 fine levied by the FCC. Tampa lawyer and Federation chief counsel Ralph Fernandez is responding to the FCC's fine notice. Pisano says that the broadcasts have ceased. We thank *MT* reader Don Bice for a copy of the newspaper article with this follow-up information.

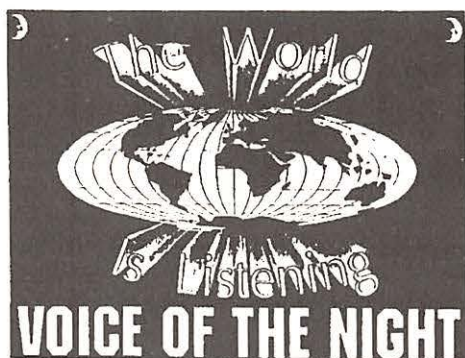
FCC Busts Freebanders

The May issue of *W5YI Report* chronicled a major FCC bust of CB Freeband operators. On March 12 and 13, all FCC field operations bureaus coordinated a mass enforcement campaign against unlicensed two-way freeband transmitters. Literally thousands of these freebanders are audible every day above and below the legitimate CB band, roughly between 26000-26700 and 27500-28000 kHz. More than 60 were visited by the FCC during the mass bust.

My own monitoring indicates that the bust had little effect on the volume of unlicensed transmissions in the freeband. One source of information about this band is the *CB/News Voice* bulletin. Publisher Charles Allen, who sent *MT* a copy of his newsletter, says that sample copies are available for \$1.25 via 719 North Grant Street, Bloomington, Indiana 47408.

Local Pirate News

On the east coast, an FCC news release reports that its New York field office raided **Radio Guinan** on April 28. This 1260 kHz mediumwave pirate allegedly was operated by Jean Lucien Borges of the Guinan Community Information Center from the Flatbush neighborhood of Brooklyn, New York. The FCC says that the bust came in response to interference com-



The Voice of the Night remains controversial.

plaints from licensed stations WADO, 1280 kHz in New York, and WFME, a New Jersey FM station. Thanks go to Dave Alpert of New York City for a tip on this bust.

On the west coast, KAXX, Mission District Radio has been creating a more positive stir. This low power FM pirate on 89.9 MHz transmits from San Francisco's Mission District, which became well known a couple of years ago during the earthquake. The station's grass roots political advocacy format has been copied from literally thousands of similar stations in Japan and Italy! Thanks go to several California *MT* readers who sent in a KAXX article from the May 13 *San Francisco Bay Guardian*, including Henry Mensch and S. Turner of San Francisco and Jeffrey Zimmerman of Petaluma.

Don Putnick of Hawthorne, California, and Tom Risher of Whittier, California, sent in material on the "Green Hornet" utility pirate bust in Los Angeles. Van Williams, the actor who played the Green Hornet on the old TV show, now owns a business FM repeater transmitter. Just like his old TV character, Williams tracked down and busted several pirate users of his repeater. Now, if the LAPD can just bring Sgt. Joe Friday out of retirement...

Numbers Logs

Readers are responding to our request for numbers station logs. Amateur radio operator Larry Varner of Harlingen, Texas, unfortunately suffers 20 meter interference from a five digit group Morse code numbers station on 14076 kHz around 0830. Todd Dokey of Lodi, California, hears female Spanish numbers around 0200-0500 on 8140, 9080, 9260, 10655 and 11565 kHz. On "World of Radio," *MT's* Glenn Hauser reported numbers station interference to the new shortwave broadcaster in Palau! Todd Dokey also sends in a large number of additional strange and interesting intercepts that we will examine in future issues.

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Editor's Note: The procedures detailed in this book are unlawful to perform. The text is intended for educational purposes only. Monitoring Times assumes no responsibility for any liability which may result from the implementation of its contents.

Pirates Heard

Once again, we are overwhelmed by many dozens of North American pirate station loggings. I still welcome comments from readers and contributors about our new loggings summary format. Do you like it? Maildrop addresses used by stations listed this month include P.O. Box 452, Wellsville, NY 14895; P.O. Box 109, Blue Ridge Summit, PA 17214; P.O. Box 69, Wolf Run, OH 43970; P.O. Box 40554, Washington, DC 20016; P.O. Box 25302, Pittsburgh, PA 15242; and P.O. Box 293, Merlin, Ontario NOP 1W0.

CSIC- 7413 kHz at 0200. Pirate Rambols rock, comedy, pirate radio commentary, and relays of other pirates have been widely heard from Canada lately. Addr: Blue Ridge Summit. (Anthony Santora, Trumbull, CT)

KBFA- 7417 kHz at 0400. "The Archer" sometimes moves down from 8000 kHz to 41 meters with his rock shows from the Broadcasters of Free America. Addr: still none, unfortunately. (Robert Thomas, Bridgeport, CT)

Omega Radio- 7416 kHz at 0500. A QSL received from station operator Dick Tator says that future shows will be relayed via **Radio USA**, given a "recent visit" of Omega by the FCC. Addr: Wellsville. (Ed Raosch, Cedar Grove, NJ)

Radio Clandestine- 7416 kHz at 0130. R. F. Burns' rock and comedy remains the oldest continuously operating North American pirate, but this year's broadcasts may simply be relays of old tapes. Addr: old addresses are currently invalid. (Patrick Murphy, Chesapeake, VA)

Radio DC- 7416 kHz at 0200. This left wing political station has been broadcasting shows in CW Morse code lately, in addition to its normal talk programming. Addr: none, but has verified loggings in *ACE* with the QSL pictured this month. (Al Underwood, Silver Springs, NY)

RFM- 9430 kHz at 0200. H. V. Short's jazz, new age, and comedy format sometimes shows up in the 31 and 19 meter shortwave broadcast bands! Addr: Blue Ridge Summit. (George Zeller, Cleveland, OH)

Saudi Sam- 7415 kHz at 0130. This Persian Gulf War station has returned with rock and pirate commentary, supposedly from The Desert Network in Saudi Arabia. Addr: Wolf Run. (Murphy, VA)

UFO- 7414 kHz at 2200. Here's another new station that transmits in Morse code; I wonder how many pirate DXers can copy the code? Addr: none. (Zeller, OH)

Voice of Bono- 7415 kHz at 0300. A QSL indicates that the station now features drama and nostalgia programming. Addr: Wellsville. (Carl McGuinness, Tallahassee, FL)

Voice of the Night- 7415 kHz at various times. The station's young boy host "Lad" continues to be unpredictable and controversial; his shows range from a live off-air relay of TV Kentucky Derby horse race coverage to spur of the moment short music bursts and sound effects. Addr: is verifying as pictured this month, but now uses Pittsburgh "only." (Glenn Waber, Hubertus, WI)

WARI- 7415 kHz at 0000. Alternative Radio International features rock and pirate radio news. Addr: Wellsville. (Thomas, CT)

WBNI- 7425 kHz at 2000. Captain Bunny of the People's Committee on Solidarity with Rodent Freedom Fighters now sells taped shows for \$5 through his maildrop. Addr: Washington. (Waber, WI)

WEED- 7415 kHz at 0600. This one is now being heard all over the USA with rock and drug related programming. Addr: None. (Waber, WI)

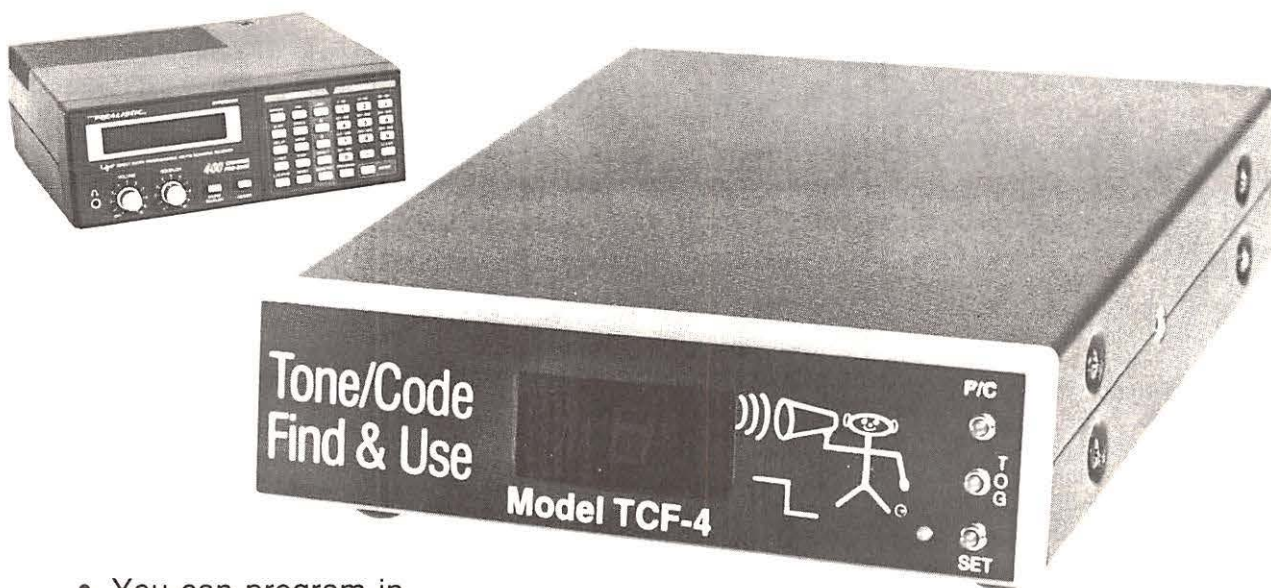
WGOP- 7417 kHz at 0200. Conservative Radio's Republican advocacy format has created a feud with the leftist Radio DC. Addr: Wellsville. (Alan Masyga, Winona, MN)

WSRN- 15050 kHz at 2245. A new station that features rock, comedy, and novelty songs, sometimes on 19 meters. Addr: Merlin. (Dave Gasque, Orangeburg, SC)

WVOL- 7420 kHz at 0200. Captain Willy from the Voice of the Loon programs rock, comedy, mailbags, and a distinctive loon interval signal. Addr: Wellsville. (Raosch, NJ)

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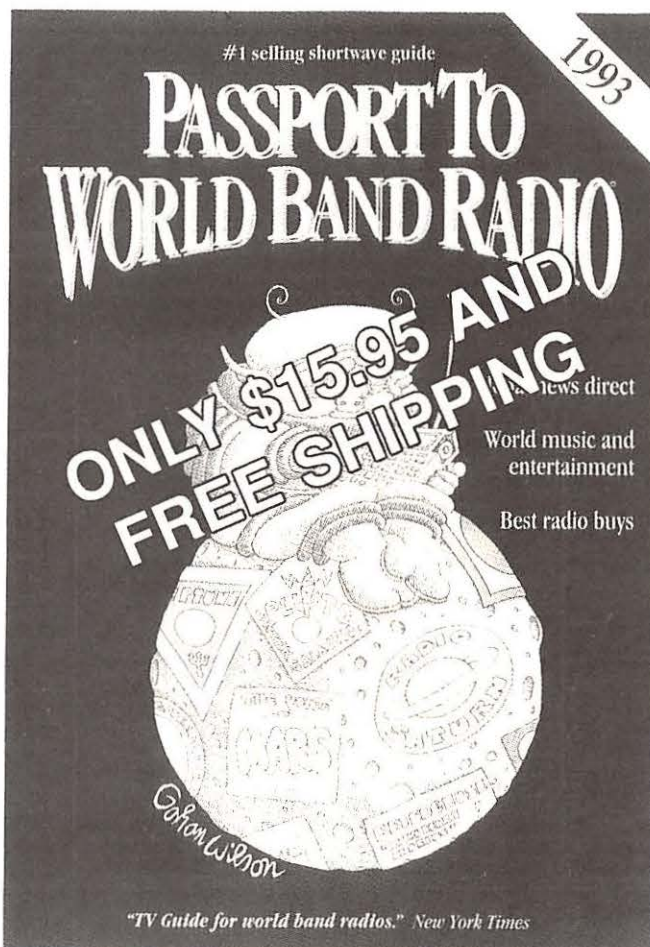
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Hard Lines and Hardened Criminals

Well here it is! Just what you requested! A column that is light on gab and full of traffic and loggings. Let me know if you'd like to see more of this or if you like it a bit more technical. How about another contest? One where you really have to put on your thinking caps and decipher encrypted traffic. Tune in next month and see what I surprise you with!

Snafu

We jumped the gun last month on the legalities of listening to pagers. According to Bob Grove, you can listen to tone-only pagers and voice pagers that are not common carrier (page for hire) frequencies, but you CANNOT listen to the contents of digital paging transmissions.

So, while the new Universal M8000 multi-mode decoder is legal to own, it is unlawful under the present interpretation of the Electronic Communications Privacy Act of 1986 (ECPA) to use its capability of listening in on digital paging transmissions.

Richard Crisp copied North Korea on 11,476 kHz using 50 baud and an unusual shift of 337 Hz from the San Francisco Bay area. With his RACAL RA6793A and a Universal M7000 he was able to copy the following text.

PYONGYANG MAY 25 KKCNA) AA THE SOUTH KOREAN AUTHORITIES REPORTED THAT THEY CAPTURED TWO AND MISSED ONE OUT OF THREE PEOPLE'S DGRMY SOLDIERS WHO +INFILTRATED+ INTO THE AREA OF THE SOUTH SIDE ACROSS THE MILITARY DEMARCATION LINE ON MAY 22 AND, SOME TIMES LATER, THEY ANNOUNCED THAT THREE OTHER PEOPLE DGRMY SOLDIERS WERE ALL KILLED IN AN EXCHANGE OF FIRE IN THE DEMILITARIZED ZONE NORTH OF CHOLWON COUNTY OF SOUTH KOREAN KANRWON PROVINCE.

BRANDING THE PUPPETS' ANNOUNCEMENT OF +INFILTRATION+, THE LIKE AS AN UNFOUNDED FABRICATION WHICH HAS NOTHING TO DO WITH THE MISSION OF THE PEOO'S ARMY AND AS A DRAMA OF THEIR OWN WRITING FROM AN INSIDIOUS PURPOSE, A RODONG SINMUN ANALYST TODAY SAYS:

THE SOUTH KOREAN PUPPETS' OUTCRIES OVER +INFILTRATION+ FROM THE NORTH ARE A DELIBERATE AND PREARRANGED DRAMA TOHGET ON OUR CERVES AND INCREASE THE TENSION.

AS IS KNOWN, THE SOUTH KOREAN AUTHORITIES ARE RESORTPVG TO AN OPEN DELAYING TACTICS IN IMPLEMENTING THE NORTH-SOUTH AGREEMENT AFTER SIGNING IT UNDER THE PRESSURE OF PUBLIC OINION AT HOME AND ABROAD. THEIR FALSE PROPAGANDA AND MILITARY PROVOCATIONS ARE PREMEDITATED MOVES TO LAY A NEW OBSTACLE IN THE WAY OF THE IMPLEMENTATION OF THE AGREEMENT BY COILING UP THE TENSION WITH THEM.

BUT THIS IS NOT ALL SOUGHT BY THEM IN THE DRAMA.

THE ANTI-DEMOCRATIC LIBERAL PARTY+ AND ANTI-+GOVERNMENT+ STRUGGLES OF THE PEOPLE HAVE RISEN TO A HIGH TIDE IN SOUTH KOREA AROUND THE +NOMINATION OF THE PRESIDENTIAL CANDIDATE OF THE DLP+ AND THE ANNIVERSARY OF THE HEROIC KWANGJU POPULAR UPRISING. THE SOUTH KOREAN AUTHORITIES SEEK TO FOSTER DISTRUST IN THE NORTH AMONG SOUTH KOREAN PEOPLE THROUGH THE DRAMA AND HARSHLY SUPPRESS THEIR JUST STRUGGLEH BY CONNECTING IT WITH THE NORTH AND THUS BRIDGE OVER THE CRISIS OF THEIR +REGIME+.

THIS, HOWEVER, IS NOTHING BUT THE LAST-DITCH EFFORT OF KTHOSE IN CRISIS.

ANY SELF-MADE DRAMA CANNOT BE A GOOD WAY OUT FOR THE SOUTH KOREAN RULERS. APA

Even with the fall of the Communist Party in Russia and the liberation of countries in Europe, you can still tune in "hard line" propaganda on the HF bands. Thanks, RC!

Interpol

Here are some examples of INTERPOL traffic that were sent in by Tim Tyler, KA8VIR, in Ypsilanti, Michigan:

ZCZC AMSS ISLAMA 001 211291 0704 ROME 013 211291 0702
RR ISLAMA
MSG ROME NR 26597
WITH REFERENCE TO YOUR R/M EA/73 (V)NCB/91/5469 DATED 16.11.91 CONCERNING THE PAKISTANI NATIONAL ALI BABAZ, BORN IN 1960 IN LAHORE/PAKISTAN. PLEASE BE INFORMED THAT WE ARE NOT IN POSSESSION OF HIS PASSPORT PARTICULARS. YOU ARE KINDLY REQUESTED TO LET US KNOW IF YOU CAN COMMUNICATE US THE PRESENT PLACE OF RESIDENCE AND ADDRESS OF THE A/M SUBJECT. THANK YOU FOR YOUR CO-OPERATION.
REGARDS. END.

IP ROME

ZCZC AMSS ISLAMA 002 211291 0854 FRANCE 002 211291 0854

RR ISLAMA
INFORM IPGS
DCPJ/AC 7/OCRTIS/BCN 12293/ST/COL90045085/C31563

REFERENCE YOUR RADIO EA/90 B NCB/90/6223 DATED 1291
PLEASE FIND HEREUNDER COPY OF YOUR RADIO DCPJ/AC/7/OCRTIS/NR
C26131/COL 90045085 OF 17/10/91

QUOTE
FURTHER TO YOUR REQUEST PLEASE BE ADVISED THAT SUBJECTS ABBAS MOHAMED
RACOF NAJAM
SHAMS HABIB
WERE ALL RESIDING TOGETHER AT THE TIME AT ADDRESS 56 BOULEVARD JOFFRE ARGENTEUIL (95)
AFTER BEING INTERVIEWED THEY WERE BROUGHT TO THE PUBLIC PROSECUTOR'S OFFICE IN PONTOISE ON 11/10/1990. JUDGE JEANTON WAS NAMED RESPONSIBLE FOR THIS CASE AND ALL THREE SUBJECTS WERE PLACED IN DETENTION IN PONTOISE PRISON (95)
STOP
UNQUOTE END

IP FRANCE
NK

ZCZC AMSS TOKYO 002 211291 0712 WIESBA 001 211291 0708
RR IPCQ
WIESBADEN 46492 211291 0644 GMT
ROUTINE

INTERPOL DIFFUSION
PR 32-02 - SCH 253 389 FA (46492)
OUR RADIO MESSAGE NR 37241 OF 17/10/91 CONCERNING INTERNATIONAL SEARCHES FOR GERMAN NATIONAL SCHARIO FORENAME MICHAEL BORN 12/7/57 WAHLEN.
SCHARIO HAS BEEN ARRESTED IN GREECE FOR EXTRADITION TO THIS COUNTRY. IT IS HOWEVER REQUESTED THAT THE SEARCHES BE MAINTAINED UNTIL HE HAS BEEN EXTRADITED TO GERMANY.
REGARDS END

INTERPOL WIESBADEN

ZCZC AMSS TOKYO 003 211291 0720 WIESBA 002 211291 0716
RR IPCQ
WIESBADEN 46493 211291 0644 GMT

ROUTINE

INTERPOL DIFFUSION
PR 32-08 - G 346 266 FA (46493)
OUR RADIO MESSAGE NR 17678 OF 2/6/86 CONCERNING

INTERNATIONAL SEARCH FOR SPANISH NATIONAL GAREA LOPEZ FORENAMES JOSE LUIS BORN EXWXTW VALLADOLID, SPAIN. PLEASE DISCONTINUE THE SEARCHES FOR THE SUBJECT. THE PUBLIC PROSECUTOR'S OFFICE IN FRANKFURT/MAIN HAVE CANCELLED THE SEARCHES. YOUR COOPERATION IS APPRECIATED.

OUR RECORDS ON THIS PERSON ARE FOR CID PURPOSES ONLY AND WILL BE DESTROYED ON 18/2/96 UNLESS NEW INFORMATION IS ADDED. FOR INTERPOL MADRID: PLEASE LET US KNOW WHETHER OR NOT THE SUBJECT WHO WAS ARRESTED IN BARCELONA ON 6/5/86 HAS BEEN CONVICTED IN SPAIN. PLEASE SUPPLY COPY OF SENTENCE. PLEASE REPLY IOREDS D

INTERPOL frequencies:

Freq	Callsign	Baud/Shift
03,593	FSB53	100/170 SITOR-A INTERPOL, PARIS
03,714	FSB52	100/170 SITOR-A INTERPOL, PARIS
03,717	FSB52	100/170 SITOR-A INTERPOL, PARIS
04,632.5	FSB54	100/170 SITOR-A INTERPOL, PARIS
05,208	FSB52	100/170 SITOR-A INTERPOL, PARIS
05,208	DEB	100/170 SITOR-AINTERPOL, WIESBADEN
06,792	FSB55	100/170 SITOR-A INTERPOL, PARIS
06,905	FSB52	100/170 SITOR-A INTERPOL, PARIS
07,532	FSB57	100/170 SITOR-A INTERPOL, PARIS
08,045	FSB52	100/170 SITOR-A INTERPOL, PARIS
08,045	IUV81	100/170 SITOR-A INTERPOL, ROME
08,122	ONA20	100/170 SITOR-A INTERPOL, BRUSSELS
10,380	FSB59	100/170 SITOR-A INTERPOL, PARIS
12,224.5	FSB52	100/170 SITOR-B INTERPOL, PARIS
15,684	FSB52	100/170 SITOR-A INTERPOL, PARIS
18,190	FSB61	100/170 SITOR-A INTERPOL, PARIS
18,756	JPA24	100/170 SITOR-A INTERPOL, TOKYO
19,130	FSB61	100/170 SITOR-A INTERPOL, PARIS
19,130	JPA59	100/170 SITOR-A INTERPOL, TOKYO
19,405	FSB63	100/170 SITOR-A INTERPOL, PARIS
19,405	AYA	100/170 SITOR-AINTERPOL, BUENOSAIRE
24,110	AYA29	100/170 SITOR-AINTERPOL, BUENOSAIRE

I did a little snooping the last month, and I came up with a logging list of my own. I wasn't able to copy signals like the 39 tone modem or MF (Multi Frequency) data, but I did log them for future reference. You never know, maybe someday there will be a decoder available that will copy these strange modes! Please send in your loggings or post them on the MT BBS (Reading RTTY) from 6:30pm to 8am Monday through Friday and 24 hours on weekends. The phone number is (704) 837-7081 (9600, 14400 BPS) or 837-9200.

NNN

Loggings

kHz	Callsign	Mode	Traffic
04,460	WLO	100/170	SITOR-B FREQ LIST
06,414	WLO	100/170	SITOR-B SAME AS 4,460
07,833	?		OLD PICCOLO
07,913.5	AFA1DA	PACKET	AIRFORCE MARS
08,083	KM!	100/170	SITOR-B WX & STATION INFO
08,0892	NAM	MORSE	CQ DE NMN/NAM/NAR
08,1235	?	300/170	PACKET ?
08,425	KLB	100/170	SITOR-B
08,512	WLO	100/170	SITOR-B WX
08,588	HPP	MORSE	FREQ LIST
10,388	?	PACKET	?
10,422	?	MF	DATA
16,172	?	75/85 %	CH11 & 12 FDM
16,280	MKD	50/345*	IRY FOXES
16,804	?	100/170	SITOR-B
17,150	?	FAX	
18,172	STK	50/400	RY'S
18,502	?	192/	ARQ-E3
23,434	?	39 tone modem	

Veri Signers... What's up with that?

Your QSL...that's what! An integral part of many DXers' strategy is to address their letter to the person who is known to issue QSLs for the station. This method is not so essential to the larger stations where QSLing is maintained by a staff. However, it could mean the difference of a QSL or none from a smaller station.

If you address your letter to the reported individual, it has a better chance of reaching their desk. A report addressed to just the station may be opened by anyone, and perhaps never reach the person who normally handles QSLs. When no signer's name is available, try sending your report to the Director, Manager, QSL Desk or the *Gerente* for a Spanish station. The book "QSL Survey" by Ravindranath Sewdien contains a list of 862 verification signers and much other useful information for QSLing. The 2nd edition is now available for US\$7 cash or 14 IRCs from Ravin Sewdien, Bechaniestraat 58, Paramaribo, Suriname.

What about Veri Signers for ship QSLing? I took that up with our expert Hank Holbrook, who commented, "Radio Officers may serve onboard a ship for a few months, and tend to switch often to other ships. Because of this, I recommend you address your report to the Radio Officer."

Thanks, Hank! Do you have any QSL tips or proven methods to share with our readers? Please drop me a line, folks!

ZRQ/ZSJ-
NAVCOMCEN CAPE REPUBLIC OF SOUTH AFRICA

No. 177

This confirms your reception of the
South African Naval Radio Station/
Cape Town

At 0439 Z On 1992

Frequency 8605 kHz

Output Power 30 kW

Transmitter Location: 33°41'S 18°45'E

Thank you for your report

Stanley Klemanowicz
Officer-in-charge: Navcomcen Cape

RSA 206

NR. STANLEY KLEMANOWICZ

Stanley Klemanowicz of Torrance, CA, received this ZRQ/ZSJ QSL.

address: c/o English Service to North America, P.O. Box 566, Cairo, Arab Rep. of Egypt. (Adams, NJ)

report, and three IRCs. Station address: Le Chef Des Stations luterarmees des, Transmissions De Yeuinbeul et de, Rufisque, Boite Postal 3024, Dakar, Senegal. (Klemanowicz, CA)

DENMARK

OKX - Lyngby Radio, 4410 kHz. Full data QSL card, verified by Erling Knudsen. Received in 6 days for an English utility report, and one IRC. Station address: Telecom A/S, Lyngby Radio, Statens Teletjeneste, Bagvaerd Mollevvej 3, 2800 Lyngby, Denmark. (Nagl Martin, Austrian DX Club)

FRANCE

Radio France Int'l, 17620/17850 kHz. Partial data scenery QSL card and program schedule, without veri signer. Received in 37/38 days for an English report. Station address: Boite Postal 9516, F-75016 Paris, France. (Doug Merkel, St. Louis, MO) (Edmund H. Savage, Palatine, IL) (Hilton, SC)

GUAM

KSDA, 15610 kHz. Full data 20th anniversary card, without veri signer. Received in 44 days for an English report. Station address: P.O. Box 7500, Agat, Guam 96928. (Hughes, OR)

HUNGARY

Radio Budapest, 11910kHz. Full data "Pannonhalm" card, without veri signer. Received in 19 days for an English report and souvenir postcard. Station address: Brody Sandor 5-7, H-1800 Budapest, Hungary. (Hughes, OR)

INDONESIA

Radio Republik Indonesia-Manado, 3215 kHz. Full data prepared card, and personal letter signed by C.H. Gultony. Received in 32 days for an Indonesian report, mint stamps, address label (used), and souvenir postcard. Station address: Jln TNI/12, Manado, Sulawesi Utara, Indonesia. Verified from Okinawa. (Mike Hardester, Jacksonville, NC)

IRAQ

Radio Iraq Int'l, 11945 kHz. Full data color foldout brochure, without veri signer. Received for an English report. Station address: Iraqi Broadcasting & TV Establishment, Salihiya, Baghdad, Iraq. (Randall Morrison, Tullahoma, TN)

LITHUANIA

Radio Centras, 9710 kHz. Full data scenery card, without verification signer. Souvenir cassette tape included. Received for an English report. Station address: Box 1792, LT-2019 Vilnius, Lithuania. (Morrison, TN)

SENEGAL

6WW - Dakar, 169515.5 kHz USB. Full data letter signed and stamped. Souvenir jungle scene card included. Received in 28 days for a French utility

SHIP TRAFFIC

BERG MASTER-9VEO, 156.65 MHz (Bulk Carrier). Full data prepared QSL card, and photo of ship, verified by Radio Officer. Received in 112 days for an English utility report, and one U.S. dollar. Ship address: Bergesen, D.Y., A/s-Bergehus, Drammensveien 106, Postboks 7600, Skillebekk, 0205 Oslo 2, Norway. (Holbrook, MD)

STAR/SHIP ATLANTIC-ELAJ4, 156.65 MHz (Cruise Ship). Full data prepared QSL card, verified by Radio Officer. View card of ship, and ship data sheet included. Received in 48 days for an English utility report, and mint stamps. Ship address: Premier Cruise Lines, P.O. Box 573, Cape Canaveral, FL 32920. (Holbrook, MD)

TRAVELLER-WTQ6966, 156.65 MHz (Tug). Full data prepared QSL card, verified. Received in 12 days for an English utility report and mint stamps. Ship address: Maritrans Operating Partners, 3 Parkway, Philadelphia, PA 19102. (Holbrook, MD)

SICILY

Radio Uno - via Calanissetta, 9515 kHz. Partial data card, without veri signer. Received in 41 days for an English report and one US dollar. Station address: Via Cerda 19, 90139 Palermo, Sicily. (Hardester, NC)

SOUTH AFRICA

ZRQ - Navy Comm Center, 8605 kHz USB. Full data card, without veri signer. Received in 65 days for an English utility report, and two IRCs. Station address: c/o Officer-in-Charge, NAVCOMCEN Cape, Ugnberg, Rep. of S. Africa. (Klemanowicz, CA)

Radio RSA, 15230 kHz. Full data color QSL card and program schedule, without veri signer. Received in 36 days for an English report. Station address: P.O. Box 91313, Auckland Park 2006, South Africa. (Klemanowicz, CA)

UNITED STATES

NOJ - CG Comm Sta., 8628.5 kHz USB. Full data letter. QSL card, and Coast Guard cutter post card, without veri signer. Received for an English utility report and two mint stamps. Station address: c/o Radioman-in-Charge, Coast Guard Communication Station, P.O. Box 190017, Kodiak, AK 99619-0017. (Klemanowicz, CA)

930-AM, WZNN. Partial data letterhead QSL, verified by Fredericka B. Olson-Office Manager. Received in 7 days after a follow-up-report, a self-addressed-stamped envelope. Station address: P.O. Box 130, Rochester, NH 03867. (Harold Frodge, Midland, MI)

AIRCRAFT TRAFFIC

COAST GUARD HILO-CG6585, (HH-65A Dolphin) 156.8/157.15 MHz. Full data prepared card verified. Hilo photo included. Received in 172 days for an English utility report, and mint stamps. Aircraft address: Cape May Air Station, USCG, Cape May, NJ 08204-5082. (Hank Holbrook, Dunkirk, MD)

AUSTRIA

Radio Austria Int'l, 9875 kHz. Full data QSL letter and program schedule, with illegible signature. Received in 35 days for an English report. Station address: A-1136, Vienna, Austria. (Nicholas P. Adams, Port Murray, NJ) (Frank Hillton, Charleston, SC)

BAHRAIN

Radio Bahrain, 6010/9746 kHz. Two full data QSL cards, with illegible signatures, and a written apology for the delay. Received in 5 months for an English report. Station address: P.O. Box 702, Manama, Bahrain. (Stephen J. Price, Conemaugh, PA) *Great QSL - Ed.*

ECUADOR

HCBJ, 9585/9745/11790/15155/17790 kHz. Partial and full data scenery QSL cards, without veri signers. Received in 27/29/30/35 days for English reports. (Chris Hughes, Portland, OR) (Adams, NJ) (Stanley Klemanowicz, Torrance, CA)

EGYPT

Radio Cairo, 9475 kHz. Two full data scenery cards, verified by Sator. Station souvenirs included. Received in 38 days for an English report and one IRC. Station

How to Use the Shortwave Guide

1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Daylight Time) 4, 5, 6, or 7 hours for Eastern, Central, Mountain, or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC: for example, the BBC's "Ken Bruce Show" (0030 UTC Sunday) will be heard on Saturday evening (8:30 PM Eastern, 5:30 PM Pacific) in North America, not on Sunday.

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours. If it's news you're interested in, check out the complete "Newslines" listing, which begins on the next page.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a re-run, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday	H: Thursday
M: Monday	F: Friday
T: Tuesday	A: Saturday
W: Wednesday	

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be

found at the top half of the page. All frequencies are in kHz.

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

4: Choose the most promising frequencies for the time, location, and conditions.

Of course, every station can't be heard all the time. To help you find the right frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am: The Americas	me: Middle East
na: North America	as: Asia
ca: Central America	au: Australia
sa: South America	pa: Pacific
eu: Europe	va: various
af: Africa	do: domestic broadcast
me: Middle East	om: omnidirectional

Consult the propagation charts. To further help you find the right frequency, we've included propagation charts at the back of this section, which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

Hot News and Hot Spots

In the months between the quarterly DX Program listings, we will try an experimental mixture of DX news and world events that could influence your listening targets. This month's tips are garnered from a variety of sources. We welcome reader input and opinions and hope you'll find these items helpful in your shortwave listening.

Fond Farewell to Tom Meyer

Regular listeners to Radio Nederland's Happy Station program will have heard the July 5th announcement that Tom Meyer, host of the show since 1970, is leaving Radio Nederland. Apparently he is hoping to indulge some theatrical interests, especially in writing and directing drama. According to the report by Tom Sundstrom on Fido Net, Pete Myers will take over the duties of the English language version of the show August 16th.

Where, Oh, Where, is Yugoslavia?

Although feature writer Charles Sorrell points out that the higher frequencies used by

Radio Yugoslavia may soon be considered a new country since the transmitter is located within Bosnia/Hercegovina, the question lately has been, "where IS Radio Yugoslavia?"

Andy Sennett of WRTN replied to this question on FidoNet's Shortwave Echo, saying that the main transmitter was out of commission (??), and Yugoslavia was using its domestic frequency of 7200 in English at 1930 and 2130 UTC.

New VOA Relay Station

According to a tip phoned in by one of our readers, the VOA has established a new relay station on Sao Tome and Principe. This is a two-island nation just west of Gabon, Africa.

Political Hot Spot: The Middle East

There has been an obvious upswing in Middle Eastern armament since the Iraq War. Saudi Arabia is hiring for many military, technical and support related jobs. Incidentally, the Saudi "Middle East Broadcasting Centre" has purchased the UPI news service.

Afghanistan has recently been the scene of fighting between Iranian backed Shiite Mus-

lims, and Saudi backed Sunnis. Afghanistan's president Mojaddidi resigned his position to Burhanuddin Rabbani under an agreement by guerrilla factions to make the country into an Islamic state.

In Algeria, the head of state was gunned down during a speech. It is believed that Mr. Boudiaf was murdered by radical Muslim fundamentalists who were not in agreement with his authority. Khaled Nezzar, Minister of Defense, vowed to "eradicate" the fundamentalists.

Forming a Muslim coalition is an idea which has never been totally successful, but which continues to be a political influence. In the region known as Kosovo (Southern Serbia), approximately 90% of the people are Albanian and mostly Muslim. Some hold out the hope of combining Kosovo with Albania and the Albanian regions of Montenegro. The resulting "state" would total nearly 5 million Muslims. The Serbian Prime Minister promised quick use of force if this is attempted.

Thanks to Todd Dokey of California for this quick compilation of places to watch in your monitoring and background on what you may hear in the news.

MT Monitoring Team*P.O. Box 98, Brasstown, NC 28902-0098*

Greg Jordan
Frequency Manager
*Call 919-661-0095 7-11 pm
with updates*

Jacques d'Avignon
Propagation Forecasts
Ontario, Canada

Kannon Shanmugam
Program Manager
Kansas

Dave Datko
California

B.W. Battin
New Mexico

**September deadline:
August 1**

John Carson
Oklahoma

Jim Frimmel
Texas

newslines

"Newslines" is your guide to news broadcasts on the air. • All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. • All broadcasts are daily unless otherwise noted by the day codes.

0000 UTC (8:00 PM EDT, 5:00 PM PDT) BBC CBC, Northern Quebec Christian Science Monitor Croatian Radio, Zagreb [M-A] Radio Australia Radio Beijing Radio Czechoslovakia Radio Havana Cuba [T-S] Radio Luxembourg Radio Moscow Int'l Radio New Zealand Int'l Radio Sofia Radio Thailand Radio Ukraine Int'l SBC Radio 1, Singapore Spanish Foreign Radio Swiss Radio Int'l Voice of America WWCR [T-A] 0005 Radio Pyongyang 0010 Radio Beijing* 0030 All India Radio Christian Science Monitor (SE Asia) [M] Christian Science Monitor [T-F] HCJB Radio Havana Cuba [T-S] Radio Korea Radio Netherlands Radio New Zealand Int'l [M-F] Radio Yugoslavia Voice of America (Americas, East Asia) (Special English) [T-S] Voice of America (East Asia) (Special English) [M] 0045 Radio Korea (News Service) 0055 WRNO [W, A] 0100 UTC (9:00 PM EDT, 6:00 PM PDT) BBC CBC, Northern Quebec [S-M] Christian Science Monitor Croatian Radio, Zagreb [S] Deutsche Welle FEBC Radio Int'l, Philippines	Radio Australia Radio Belize Radio Canada Int'l [S-M] Radio Czechoslovakia Radio Havana Cuba [T-S] Radio Japan Radio Luxembourg Radio Moscow Int'l Radio New Zealand Int'l [M-A] Radio Tashkent Radio Thailand Radiotelevisione Italiana SBC Radio 1, Singapore Spanish Foreign Radio Voice of America Voice of Indonesia WWCR [T-A] 0115 Radio Havana Cuba* [T-S] 0125 Radio Korea [T-A] 0130 Christian Science Monitor (SE Asia) [M] Christian Science Monitor [T-F] Radio Austria Int'l Radio Finland [T-A] Radio Havana Cuba [T-S] Radio Netherlands Radio Yugoslavia Voice of Greece [M-A] 0155 Voice of Indonesia 0200 UTC (10:00 PM EDT, 7:00 PM PDT) BBC CBC, Northern Quebec [T-S] Christian Science Monitor Deutsche Welle Radio Australia Radio Budapest Radio Havana Cuba [T-S] Radio Moscow Int'l Radio New Zealand Int'l [M-F] Radio Romania Int'l Radio RSA Radio Thailand RAE, Buenos Aires [T-A] SBC Radio 1, Singapore Swiss Radio Int'l Voice of America Voice of Free China	Voice of Myanmar WWCR [T-A] 0215 Radio Cairo Radio Nepal 0230 Christian Science Monitor (Africa, Middle East) [M] Christian Science Monitor [T-F] HCJB Radio Havana Cuba [T-S] Radio Iraq Int'l Radio Moscow Int'l Radio Netherlands Radio Pakistan (Special English) Radio Portugal [T-A] Radio Tirana, Albania SLBC, Sri Lanka 0250 Radio Yerevan 0300 UTC (11:00 PM EDT, 8:00 PM PDT) BBC CBC, Northern Quebec Christian Science Monitor Deutsche Welle Radio Australia Radio Bahrain Radio Beijing Radio Canada Int'l Radio Czechoslovakia Radio Havana Cuba [T-S] Radio Moscow Int'l Radio New Zealand Int'l [W-F] Radio Romania Int'l Radio RSA Radio Tanzania Radio Thailand SBC Radio 1, Singapore Swiss Radio Int'l Voice of America 0405 Radio Pyongyang 0410 Radio Beijing* 0425 Radiotelevisione Italiana 0430 BBC (Africa)* [M-A] Christian Science Monitor (Africa, Asia) [M] Christian Science Monitor [T-F] Radio Bahrain Radio Botswana Radio Havana Cuba [T-S] Radio Moscow Int'l (World Service) 	0450 Radio RSA 0500 UTC (1:00 AM EDT, 10:00 PM PDT) BBC ("Newshour") CBC, Northern Quebec Christian Science Monitor Deutsche Welle HCJB Radio Australia Radio Bahrain Radio Japan Radio Lesotho Radio Moscow Int'l Radio New Zealand Int'l [M-F] Radio RSA Radio Thailand SBC Radio 1, Singapore Spanish Foreign Radio Voice of America WWCR 0510 Radio Botswana 0515 Radio Canada Int'l [M-F] 0520 Radio Finland [T-A] 0530 Christian Science Monitor (Africa, Asia) [M] Christian Science Monitor [T-F] Radio Austria Int'l Radio Moscow Int'l (World Service) Radio Romania Int'l Radio Thailand RTM, Malaysia UAE Radio, Dubai Voice of Nigeria 0550 Radio For Peace Int'l [T-A] 0600 UTC (2:00 AM EDT, 11:00 PM PDT) BBC Christian Science Monitor Deutsche Welle GBC Radio, Accra* Radio Australia Radio Bahrain Radio Havana Cuba [T-S] Radio Korea
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newsline

Radio Moscow Int'l
Radio New Zealand Int'l
Radio RSA
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
WWCR [M-A]
0603
Croatian Radio, Zagreb [M-A]
0605
Radio Pyongyang
0609
BBC*
0610
Voice of Malaysia
0630
BBC (Africa)*
BRT, Brussels
Christian Science Monitor [M-F]
Radio Austria Int'l [T-A]
Radio Havana Cuba [T-S]
Radio Moscow Int'l (World Service)
RTV Congolaise, Brazzaville [M-F]
Voice of Nigeria
0640
Radio Czechoslovakia
0645
Radio Finland [T-A]
Radio Romania Int'l
0655
Radio Korea [M-F]

0700 UTC
(3:00 AM EDT, 12:00 AM PDT)
BBC
Christian Science Monitor
GBC Radio, Accra
MBC, Blantyre, Malawi [M-A]
Radio Australia
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow Int'l
Radio New Zealand Int'l [M-F]
SBC Radio 1, Singapore
SLBS, Freetown, Sierra Leone
Voice of Free China
Voice of Myanmar
0703
Croatian Radio, Zagreb [S]
0705
Radio Pyongyang
0715
Radio Havana Cuba* [T-S]
0730
BBC (Africa)* [M-A]
Christian Science Monitor [M-F]
HCJB
Radio Austria Int'l
Radio Czechoslovakia
Radio Ghana
Radio Havana Cuba [T-S]
Radio Moscow Int'l (World Service)
Radio Netherlands
0745
Radio For Peace Int'l [T-A]
0755
Radio Japan [M-F]

0800 UTC
(4:00 AM EDT, 1:00 AM PDT)
BBC
Christian Science Monitor

GBC Radio 1, Accra [S]
GBC Radio 2, Accra
MBC, Blantyre, Malawi [S]
Radio Australia
Radio Bahrain
Radio Finland [T-A]
Radio Korea
Radio Moscow Int'l
Radio New Zealand Int'l [S-F]
Radio Pakistan
SBC Radio 1, Singapore
SLBS, Freetown, Sierra Leone
Voice of Indonesia
0803
Croatian Radio, Zagreb [M-A]
0805
Radio Pyongyang
0810
Voice of Malaysia
0830
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Finland [T-A]
Radio Netherlands
0840
Voice of Greece [M-A]
0855
Radio Korea [M-F]
Voice of Indonesia

0900 UTC
(5:00 AM EDT, 2:00 AM PDT)
BBC
BRT, Brussels [M-A]
Christian Science Monitor
Deutsche Welle
GBC Radio 1, Accra [M-F]
GBC Radio 2, Accra
MBC, Blantyre, Malawi [M-A]
Radio Australia
Radio Bahrain
Radio Beijing
Radio Japan
Radio Moscow Int'l
Radio New Zealand Int'l [S-M, W-H]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of Nigeria
0903
Croatian Radio, Zagreb [S]
0910
Radio Beijing*
0915
Radio Korea (News Service)
0930
Christian Science Monitor [M-F]
Deutsche Welle (Africa)* [M-F]
Radio Afghanistan
Radio Moscow Int'l
Radio Netherlands
0940
Radio Togo
0950
Radio Tikhoy Okean [S]
0955
Radio Japan [M-F]

1000 UTC
(6:00 AM EDT, 3:00 AM PDT)
All India Radio
BBC
Christian Science Monitor
GBC Radio 2, Accra [A]
HCJB

Kol Israel
MBC, Blantyre, Malawi [S]
Radio Australia
Radio Bahrain
Radio Beijing
Radio Moscow Int'l
Radio New Zealand Int'l
Radio RSA
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
1010
Radio Beijing*
1030
Christian Science Monitor [M-F]
MBC, Blantyre, Malawi [M-F]
Radio Austria Int'l [M-F]
Radio Korea
Radio Moscow Int'l
RTM, Malaysia
UAE Radio, Dubai
Voice of Nigeria
1040
Voice of Greece [M-A]
1055
All India Radio

1100 UTC
(7:00 AM EDT, 4:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
Deutsche Welle
GBC Radio, Accra [A-S]
MBC, Blantyre, Malawi [A-S]
Radio Australia
Radio Bahrain
Radio Japan
Radio Jordan
Radio Korea
Radio Moscow Int'l
Radio New Zealand Int'l [S-F]
Radio Pakistan
Radio RSA
Radio Sofia
SBC Radio 1, Singapore
Swiss Radio Int'l
TWR, Bonaire [M-F]
Voice of America
WWCR [M-F]
1105
Radio Pakistan (Special English)
Radio Pyongyang
1110
Radio Belize [T-A]
Radio Botswana [M-F]
1115
Radio Korea (News Service)
Radio Nepal
1125
Radio Belize [M]
Radio Botswana [A-S]
Radio Finland [T-F]
1130
BRT, Brussels [S]
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Radio Austria Int'l [M-F]
Radio Lesotho
Radio Moscow Int'l
Radio Yugoslavia
RTM, Malaysia*
1135
Radio Thailand
1150

Radio RSA
1155
Radio Japan [M-F]
Radio Korea [M-F]
1200 UTC
(8:00 AM EDT, 5:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
MBC, Blantyre, Malawi [M-F]
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Beijing
Radio Canada Int'l [M-F]
Radio Moscow Int'l
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l
Radio Tashkent
Radio Thailand
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
Voice of America
WWCR [M-F]
1203
Croatian Radio, Zagreb
1209
BBC* [M-A]
1210
Radio Beijing*
1215
HCJB [M-F]
Radio Korea
1230
Christian Science Monitor [M-F]
Radio Cairo
Radio Finland [T-F]
Radio France Int'l
Radio Moscow Int'l
SLBC, Sri Lanka
TWR, Bonaire
Voice of Turkey
1235
Voice of Greece
1245
SLBC, Sri Lanka
1255
WYFR (Network) [M-F]
1257
HCJB [M-F]
1258
Africa Number One, Libreville

1300 UTC
(9:00 AM EDT, 6:00 AM PDT)
BBC ("Newshour")
BRT, Brussels [M-A]
CBC, Northern Quebec
Christian Science Monitor
GBC Radio, Accra
Kol Israel
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize
Radio Canada Int'l [S]
Radio Finland [A]
Radio Jordan
Radio Moscow Int'l
Radio Romania Int'l
Radio Tanzania [A-S]
SBC Radio 1, Singapore
Swiss Radio Int'l

Voice of America
1305
Radio Pyongyang
1310
Radio Beijing*
Radio Korea [M-F]
1320
SLBC, Sri Lanka
1325
HCJB [M-F]
1328
Radio Cairo
1330
All India Radio
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Austria Int'l [M-F]
Radio Canada Int'l [M-F]
Radio Finland [T-F]
Radio Moscow Int'l
Radio Netherlands
Radio Tashkent
RTM, Malaysia
UAE Radio, Dubai
Voice of America (Special English)
1346
All India Radio [A]
1350
Radio For Peace Int'l [T-A]

1400 UTC
(10:00 AM EDT, 7:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
GBC Radio, Accra
MBC, Blantyre, Malawi [M-F]
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio France Int'l
Radio Japan
Radio Korea
Radio Moscow Int'l
RTM, Malaysia*
SBC Radio 1, Singapore
Voice of America
WWCR [M-F]
1405
Radio Finland [T-A]
1410
Radio Beijing*
1415
Radio Canada Int'l
Radio Korea (News Service)
Radio Nepal
1425
HCJB [M-F]
1430
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Austria Int'l
Radio Moscow Int'l
Radio Netherlands
Radio Romania Int'l
Radio Tirana, Albania
1445
BBC (East Asia) (Special English) [M-F]
Voice of Myanmar
1455
All India Radio
Radio Korea [M-F]

Japan Radio Company

THE NRD-525 CLOSEOUT!



Specifications include:

Frequency Range: 90-34000 kHz
Sensitivity: .5uV 1.6-34 MHz
SSB/CW S+N/N=1-dB
IF Rejection: >70 dB (1.6-34 MHz)
Image Ratio: >70 dB (1.6-34 MHz)
Dynamic Range: 100 dB (IF bandwidth 500 Hz)
Drift: +/- 3 PPM
Memory Channels: 200
Power: 100/120/220/240 VAC
50/60 Hz 35VA max.
12 VDC 25W max.

NOW ONLY:
\$889.95!*

Order RCV16

As is the way with all things, eventually a receiver is going to be discontinued. The NRD-525 has shown through strong while it was still being made and is even stronger now, because Grove can now offer this giant in the radio market for a greatly reduced price! Now that the new NRD-535 has been released, you can get this highly praised NRD-525 receiver at a greatly reduced price. All of the pleasure and feel of a JRC is in this spectacular radio. So if you are in the market for a receiver, then the NRD-525 is a solid choice.

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BRASSTOWN, NC 28902-0098

**Plus \$20 UPS Ground Shipping*

newsline

1500 UTC

(11:00 AM EDT, 8:00 AM PDT)
BBC

CBC, Northern Quebec [A-S]
Christian Science Monitor
Deutsche Welle
GBC Radio 2, Accra
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-A]
Radio Japan
Radio Jordan
Radio Moscow Int'l
Radio Portugal [M-F]
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
1505
Radio Pyongyang
1510
Radio Beijing*
1520
Radio Tallinn [M-F]
1530
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
FEBA, Seychelles
FEBC Radio Int'l, Philippines
Radio Austria Int'l [M-F]
Radio Moscow Int'l
Radio Netherlands
Voice of Greece [M-A]
Voice of Nigeria
1545
Radio For Peace Int'l [T-A]
Radio Korea (News Service)

1600 UTC

(12:00 PM EDT, 9:00 AM PDT)
BBC

CBC, Northern Quebec [A]
Christian Science Monitor
Deutsche Welle
GBC Radio 2, Accra
MBC, Blantyre, Malawi
Radio Australia
Radio Bahrain
Radio Beijing
Radio Canada Int'l [M-F]
Radio France Int'l
Radio Jordan
Radio Korea
Radio Lesotho
Radio Moscow Int'l
Radio Pakistan
Radio RSA
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
Yemen Radio
1609
BBC*
1610
Radio Beijing*
Radio Botswana [M-F]
1615
Radio Pakistan (Special English)
1630
Christian Science Monitor [M-F]
HCJB [M-F]
Radio Canada Int'l [M-F]

Radio Moscow Int'l
UAE Radio, Dubai
Voice of America (Europe)
(Special English)
WYFR (Network) [A]
1635
WYFR (Network) [M-F]
1655
Radio Korea [M-F]

1700 UTC

(1:00 PM EDT, 10:00 AM PDT)
BBC

CBC, Northern Quebec [A]
Christian Science Monitor
GBC Radio 2, Accra
Kol Israel
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Czechoslovakia
Radio Japan
Radio Moscow Int'l
Radio New Zealand Int'l [S-F]
Radio Pakistan
Radio RSA
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
1705
Radio Pyongyang
1710
Radio Beijing*
1715
Radio Korea (News Service)
1725
Radio Surinam Int'l [M-F]
WYFR (Network) [A]
1730
Christian Science Monitor [M-F]
Radio Moscow Int'l
Radio Netherlands
Radio Romania Int'l
Radio Sofia
1740
BBC (Africa)*
1750
Radio RSA

1800 UTC

(2:00 PM EDT, 11:00 AM PDT)
All India Radio

BBC
BRT, Brussels
CBC, Northern Quebec [M-H]
Christian Science Monitor
GBC Radio, Accra
KVOH
MBC, Blantyre, Malawi
Radio Afghanistan
Radio Australia
Radio Bahrain
Radio Belize [M-F]
Radio Canada Int'l [M-F]
Radio Moscow Int'l
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l [S-F]
Radio Portugal [M-F]
Radio Tanzania
Voice of America
1830
Christian Science Monitor [M-F]
Radio Austria Int'l

Radio Belize
Radio Czechoslovakia
Radio Finland [M-F]
Radio Kuwait
Radio Moscow Int'l
Radio Netherlands
Radio Yugoslavia
Voice of America (Special English)
1840
Voice of Greece
1845
Radio Cote d' Ivoire, Abidjan
1855
BBC (Africa)* [M-F]
Radio Finland
WYFR (Network) [M-A]

1900 UTC

(3:00 PM EDT, 12:00 PM PDT)
All India Radio

BBC
Christian Science Monitor [M-A]
Deutsche Welle
GBC Radio 2, Accra*
HCJB
Kol Israel
KVOH
Radio Australia
Radio Beijing
Radio Canada Int'l
Radio Iraq Int'l
Radio Japan
Radio Korea
Radio Moscow Int'l
Radio New Zealand Int'l [S-F]
Radio Portugal [M-F]
Radio Romania Int'l
Radio Tanzania
RAE, Buenos Aires [M-F]
SLBS, Freetown, Sierra Leone
Spanish Foreign Radio
Voice of America
1910
Radio Beijing*
Radio Botswana
1920
Voice of Greece
1930
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Polish Radio, Warsaw
Radio Canada Int'l
Radio Ghana
Radio Moscow Int'l
Radio Netherlands
Voice of Nigeria
1935
Radiotelevisione Italiana
1945
Radio Sofia
Radio Togo
1955
BBC (Africa)* [M-F]
Radio Korea [M-F]

2000 UTC

(4:00 PM EDT, 1:00 PM PDT)
BBC

CBC, Northern Quebec [S-F]
Christian Science Monitor
GBC Radio, Accra
KVOH
MBC, Blantyre, Malawi
Radio Australia

Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Czechoslovakia
Radio Havana Cuba [M-A]
Radio Moscow Int'l
Radio New Zealand Int'l [S-F]
SLBS, Freetown, Sierra Leone
Swiss Radio Int'l
Voice of America
Voice of Indonesia
Voice of Nigeria
Voice of Turkey
2005
Radio Pyongyang
2010
Radio Beijing*
2025
Radio Havana Cuba* [M-A]
Radiotelevisione Italiana
WYFR (Network) [M-F]
2030
Christian Science Monitor [M-F]
Radio Havana Cuba [M-A]
Radio Moscow Int'l
WYFR (Network) [A]
2045
Radio Korea (News Service)
2055
Voice of Indonesia

2100 UTC

(5:00 PM EDT, 2:00 PM PDT)
All India Radio

BBC ("Newshour")
BRT, Brussels
CBC, Northern Quebec [S-F]
Christian Science Monitor [M-A]
Deutsche Welle
GBC Radio 2, Accra*
KVOH
MBC, Blantyre, Malawi
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Budapest
Radio Canada Int'l
Radio Czechoslovakia
Radio Japan
Radio Moscow Int'l
Radio New Zealand Int'l [S-F]
Radio Romania Int'l
Radio Ukraine Int'l
Radio Yugoslavia
SLBS, Freetown, Sierra Leone
Spanish Foreign Radio
Voice of America
2103
Croatian Radio, Zagreb
2110
Radio Beijing*
2130
Christian Science Monitor [M-F]
Kol Israel
Radio Austria Int'l
Radio Cairo
Radio Finland [M-F]
Radio Moscow Int'l
Radio Vilnius
WYFR (Network) [M-F]
2145
Radio Korea
Radio Sofia
2150
Radio For Peace Int'l [M-F]

2155

WYFR (Network) [M-A]

2200 UTC

(6:00 PM EDT, 3:00 PM PDT)
All India Radio

BBC
CBC, Northern Quebec [M-F]
Christian Science Monitor
GBC Radio 2, Accra
MBC, Blantyre, Malawi
Radio Australia
Radio Beijing
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Moscow Int'l
Radio New Zealand Int'l
Radio Tirana, Albania
Radiotelevisione Italiana
SBC Radio 1, Singapore
SLBS, Freetown, Sierra Leone
Swiss Radio Int'l
Voice of America
Voice of Free China
Voice of Turkey
2209
BBC*
2210
Radio Beijing*
2225
Radio Havana Cuba* [M-A]
2230
Christian Science Monitor [M-F]
Radio Havana Cuba [M-A]
Radio Moscow Int'l
Voice of America (Special English)
2240
Radio Korea [M-F]
2245
GBC Radio, Accra
Voice of Greece

2300 UTC

(7:00 PM EDT, 4:00 PM PDT)
All India Radio

BBC
CBC, Northern Quebec [A]
Christian Science Monitor [M-A]
Radio Australia
Radio Belize [M-F]
Radio Canada Int'l
Radio Japan
Radio Luxembourg
Radio Moscow Int'l
Radio New Zealand Int'l
Radio Vilnius
RTM, Malaysia
SBC Radio 1, Singapore
Voice of America
2305
Radio Pyongyang
2320
Radio Thailand
2330
BRT, Brussels
Christian Science Monitor [M-F]
Radio Moscow Int'l
Radio Nacional, Bogota [A]
RTM, Malaysia*
2345
Radio For Peace Int'l [M-F]
2355
Radio Japan [M-F]
WRNO [W, F]

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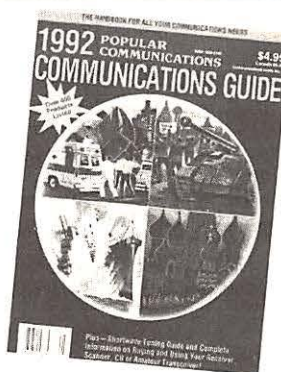
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0000 UTC

[8:00 PM EDT/5:00 PM PDT]

FREQUENCIES

0000-0027	Czechoslovakia	7345na	9580na	11990na	
0000-0030	Australia	15170va	15320va	17630as	17750as
		17880as			
0000-0030	Canada, RCI Montreal	5960am	9755am	13670am	
0000-0030 a /var	Croatian Radio via WHRI	7315na	9495na		
0000-0030	Iran, Islamic Republic	9022am	15260am	15315am	
0000-0030 sm	Norway	15165am			
0000-0030	Swiss Radio Int'l	6135na	9650na	9885na	12035na
		17730na			
0000-0030	United Kingdom, BBC London	5965as	5975na	6005af	6175na
		6195as	7145as	7325na	9580as
		11750sa	11945as	11955as	12095na
		15360pa	17830as	15070na	15260sa
0000-0045	Bulgaria, Radio Sofia	11660na	11720na	15330na	
0000-0050	North Korea	11335na	13760na	15115na	
0000-0100	Australia, ABC Brisbane	4920do	9660do		
0000-0100	Australia, ABC Perth	9610do			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	China, Radio Beijing	9770na	11715na		
0000-0100	Cook Islands	11760pa			
0000-0100	Costa Rica, AWR	9725ca	11870ca		
0000-0100	Costa Rica, RFPI	7375na	13630na	15030na	21465na
0000-0100	Cuba, RHC Havana	11970am			
0000-0100	Guam, KSDA Guam	15610as			
0000-0100	India, All India Radio	9910as	11715as	11745as	15110as
		15135as	15145as	17830as	
0000-0100 vl	Iraq, Radio Iraq Int'l	15150na	17740sa		
0000-0100	Luxembourg, RTL	15350va			
0000-0100	Malaysia, RTM Radio 4	7295do			
0000-0100	New Zealand, RNZI	17770pa			
0000-0100	Philippines, FEBC Manila	15450as			

0000-0100	Russia, Radio Moscow	11710va	11780va	11850va	12050va
	15290va	15405va	15410va	15425va	15485va
	17560va	17570va	17860va	17890va	21690va
0000-0100	Sierra Leone, SLBS	3316do			
0000-0100	Singapore, SBC1	5010do	5052do	11940do	
0000-0100	South Korea, Seoul	15575na			
0000-0100	Spanish National Radio	9530na			
0000-0100	Thailand	4830as	9655as	11905as	
0000-0100	Ukraine, Kiev	7195eu	7250eu	9640eu	10344eu
		11520eu	11790na	12000na	12040na
		12060na	13645na	15355na	15570na
		7395na	9850af	13760na	17555as
0000-0100	USA, CS Monitor Boston	17865as			
0000-0100 sa	USA, CS Monitor Boston	15590am			
0000-0100	USA, KTBN Salt Lake City	17775am			
0000-0100	USA, KVOH Los Angeles	6130am	7405am	9455am	9775am
0000-0100	USA, VOA Washington	11580am	11695am	15120am	15205am
		7315am	9495am		
0000-0100	USA, WHRI Noblesville	15145eu			
0000-0100	USA, WINB Red Lion, Penn.	7490na			
0000-0100	USA, WJCR Upton, Kentucky	7355am			
0000-0100	USA, WRNO New Orleans	7435na	12160na		
0000-0100	USA, WWCN Nashville	5985am			
0000-0100	USA, WYFR Okeechobee, FL	15320va	15365pa	15420pa	17630as
0030-0100	Australia	17715pa	17750as	17795pa	17880as
		21740pa	21775as		
0030-0100 sm	Canada, RCI Montreal	5960am	9755am		
0030-0100	Ecuador, HCJB Quito	9745am	15155am	21455am	
0030-0100	Netherlands	6020na	6165na	9860as	11655as
		11835na	13700as		
0030-0100	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
0030-0100	United Kingdom, BBC London	5965as	5975na	6005sa	6175na
		7135as	7325na	9580as	9915na
		11955as	12095na	15260sa	15360pa
0030-0100 WAR/var	Yugoslavia, Radio Federal	11870am			
0040-0050 twfhas	Venezuela, Radio Nacional	9540om			
0045-0100	South Korea World News	7275as			

SELECTED PROGRAMS

Sundays

- 0010 Voice of America (am, ca): On The Line.
 0010 Voice of America (as): VOA Morning. Sports, science, business, music, and features about America.
 0011 Radio Havana Cuba: Spotlight On Latin America. Analysis of issues affecting Latin America.
 0015 Radio Havana Cuba: Headliners. Views behind the stories.
 0030 BBC: The Ken Bruce Show. Pop music, past and present.
 0030 Voice of America (ca): Weekend Magazine. Music, conversations with correspondents, and talks about the arts.
 0035 Radio Havana Cuba: World Of Sports. Latest sports news.
 0040 Radio Havana Cuba: World Of Stamps. Philately news.
 0040 Voice of America (am, as): Americanisms
 0045 Voice of America (am: American Stories (Special English). Fictional tales by great American writers.
 0045 Voice of America (as): VOA Morning. See S 0010.

Mondays

- 0000 Radio Havana Cuba: Dateline Havana. Details not available.
 0010 Radio Havana Cuba: The Mailbag Show. Listener comments.
 0010 Voice of America (am, ca): Encounter. See S1210.
 0010 Voice of America (as): Newline. See S 2310.
 0020 Radio Havana Cuba: The Jazz Place. Langston Wright presents jazz music.
 0030 BBC: In Praise Of God. Christian religious meditations.
 0030 Voice of America (am, ca): Spotlight. Reports and interviews on people, places, and events of interest.
 0040 Voice of America (as): Science Report (Special English). Developments in the world of science and technology.
 0045 Voice of America (as): VOA Morning. See S 0010.

Tuesdays

- 0010 Voice of America (Americas, East Asia): Newline.

- 0010 Voice of America (Caribbean): Caribbean Report. The latest news, sports, financial news, and weather reports.
 0011 Radio Havana Cuba: Spotlight On The Americas. Analysis of issues affecting the Americas.
 0030 BBC: Panel Game. "Back To Square One" is a quiz on curious expressions in the English language (4th, 11st).
 0030 VOA (ca): Music, USA. (Standards). See M 1130.
 0035 Radio Havana Cuba: Sports In Cuba. An in-depth look.
 0040 Radio Havana Cuba: Let's Talk Law. A top jurist answers questions on Cuban justice.
 0040 VOA (am, as): Science Report (Spec Eng). See M 0040.
 0045 VOA (am): This Is America (Spec Eng). See M 1115.
 0045 Voice of America (as): VOA Morning. See S 0010.

Wednesdays

- 0010 Voice of America (am, as): Newline. See S2310.
 0010 Voice of America (ca): Caribbean Report. See T 0010.
 0011 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
 0015 Radio Havana Cuba: Headliners. See S 0015.
 0030 BBC: Omnibus. Features on many topics, from Draculo drugs.
 0030 VOA (Caribbean): Now Music, USA. See T 1130.
 0040 Radio Havana Cuba: DX'ers Unlimited. See S 0140.
 0040 VOA (am, as): Science Report (Spec Eng). See M 0040.
 0045 VOA (am): Science In The News (Spec Eng). See T 1115.
 0045 Voice of America (East Asia): VOA Morning. See S 0010.

Thursdays

- 0010 Voice of America (am, as): Newline. See S2310.
 0010 Voice of America (ca): Caribbean Report. See T 0010.
 0011 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
 0015 Radio Havana Cuba: Headliners. See S 0015.
 0030 BBC: Comedy/Drama. See W 1530.
 0030 Voice of America (ca): Now Music, USA. See T 1130.
 0035 Radio Havana Cuba: The Way We See It. Commentary.

- 0040 Radio Havana Cuba: Cuba Today. A magazine program.
 0040 VOA (am, as): Science Report (Spec Eng). See M 0040.
 0045 VOA (am): Space And Man (Spec Eng). See W 1115.
 0045 Voice of America (as): VOA Morning. See S 0010.

Fridays

- 0010 Voice of America (am, as): Newline. See S2310.
 0010 Voice of America (ca): Caribbean Report. See T 0010.
 0011 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
 0015 Radio Havana Cuba: Headliners. See S 0015.
 0030 BBC: Music Feature. All this month, musicians like Itzhak Perlman talk about other musicians on "The Musician's Musician."
 0030 VOA (Caribbean): Now Music, USA. See T 1130.
 0035 Radio Havana Cuba: Feature Report. Interviews with prominent figures on topics in the news.
 0040 VOA (am, as): Science Report (Spec Eng). See M 0040.
 0045 VOA (am): The Making Of A Nation (Spec Eng). See H 0045.
 0045 Voice of America (East Asia): VOA Morning. See S 0010.

Saturdays

- 0010 Voice of America: Newline. See S 2310.
 0011 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
 0015 Radio Havana Cuba: Cuba Today. See H 0040.
 0030 BBC: From The Weeklies. Freview of British weekly press.
 0030 Voice of America (ca): Country Music, USA. See F 1130.
 0035 Radio Havana Cuba: The Way We See It. See H 0035.
 0040 Radio Havana Cuba: Kaleidoscope. Cuban artists talk about their contributions to Cuba's culture and the arts.
 0040 Voice of America (am): Science Report (Spec Eng). See M 0040.
 0040 VOA (as): Words And Their Stories (Spec Eng). See S 0040.
 0045 BBC: Recording Of The Week. See M 0615.
 0045 VOA (am): American Mosaic (Spec Eng). See F 1115.
 0045 Voice of America (as): VOA Morning. See S 0010.

0100 UTC

[9:00 PM EDT/6:00 PM PDT]

FREQUENCIES

0100-0115	India, All India Radio	9910as	11715as	11745as	15110as	0100-0200	New Zealand, RNZI	17770pa			
		15135as	15145as	17830as		0100-0200	Philippines, FEBC Manila	15450as			
0100-0115 vi	Iraq, Radio Iraq Int'l	15150na	17740sa			0100-0200	Russia, Radio Moscow	11710va	11780va	11850va	12050va
0100-0120	Italy, RAI, Rome	9575am	11800am					15290va	15405va	15410va	15425va
0100-0125	Netherlands	6020na	6165na	9860as	11655as			15485va	17560va	17560va	17570va
		11835na	13700as					17655va	17860va	17890va	21690va
0100-0127	Czechoslovakia	5930na	7345na	9580na		0100-0200	Sierra Leone, SLBS	3316do			
0100-0130 twhfa	Canada, RCI Montreal	5960am	9755am			0100-0200	Singapore, SBC1	5010do	5052do	11940do	
0100-0130	Laos, National Radio of	7116as				0100-0200	Spanish National Radio	9530na			
0100-0130 sm	Norway	9615am				0100-0200	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
0100-0130	Sweden	9685as	11730as			0100-0200	Thailand	4830as	9655as	11905as	
0100-0130	Uzbekistan, R. Tashkent	5930as	5995as	7190as	7265as	0100-0200	United Kingdom, BBC London	5965as	5975na	6005sa	6175na
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9565na			7135as	7325na	9580as	9590na
		9700na	11810na	11865na	13610na			9915na	11750sa	11955as	12095na
		13770na	15105na					15260sa	15280as	15360pa	17790va
0100-0159 sm	Canada, RCI Montreal	9535am	9755am	11845am	11940am			21715as			
		13720am				0100-0200	USA, CSMonitor Boston	7395na	9850af	13760na	17555as
0100-0200	Australia	15240pa	15320va	15365pa	17630as	0100-0200 sa	USA, CSMonitor Boston	17865as			
		17715pa	17750as	17795pa	17880as	0100-0200	USA, KTBN Salt Lake City	7510na			
		21740pa	21775as			0100-0200	USA, VOA Washington	5995am	6130am	7405am	9455am
0100-0200	Australia, ABC Brisbane	4920do	9660do					9775am	11580am	15120am	15205am
0100-0200	Australia, ABC Perth	9610do						7115as	7205as	9740as	11705as
0100-0200	Canada, CFCX Montreal	6005do						15250as	17735as	21550as	
0100-0200	Canada, CFRX Toronto	6070do				0100-0200	USA, WHRI Noblesville	7315am			
0100-0200	Canada, CFVP Calgary	6030do				0100-0200	USA, WINB Red Lion, Penn.	15145na			
0100-0200	Canada, CHNX Halifax	6130do				0100-0200	USA, WJCR Upton, Kentucky	7490na			
0100-0200	Canada, CKZU Vancouver	6160do				0100-0200	USA, WRNO New Orleans	7355na			
0100-0200	Cook Islands	11760pa				0100-0200	USA, WWCR Nashville	7435na	12160na		
0100-0200	Costa Rica, RFPI	7375na	13630am	21465am		0100-0200	USA, WYFR Okeechobee, FL	5985am	9505am	15440am	
0100-0200	Cuba, RHC Havana	11970am				0100-0200	Yugoslavia, Radio Federal	11870na			
0100-0200	Ecuador, HCJB Quito	9745am	15155am	21455am		0130-0150 mtwhfa	Greece, Voice of	9395na	9420na	11645na	
0100-0200	Indonesia, Voice of	7125as	9675as	11752as	11785as	0130-0155	Finland, YLE	11755na	15185na		
0100-0200	Japan NHK	5960na	11840me	15195as	17810as	0130-0200	Austria, ORF Vienna	9875na	13730na		
		17835as	17845as			0130-0200	Netherlands	9860as	11655as	13700as	
0100-0200	Luxembourg, RTL	15350va				0130-0200	UAE Radio, Dubai	11795na	13695eu	15320eu	15435eu
0100-0200 smtwh	Malaysia, RTM Radio 4	7295do				0145-0200	Vatican Radio	9650as	11935as		
0100-0200	Namibia BC Corp, Windhoek	3290af									

SELECTED PROGRAMS

Sundays

- 0101 BBC: Play Of The Week. Hour-long drama selections.
- 0110 Voice of America (Americas, Caribbean): Communications World. A look at modern telecommunications.
- 0110 Voice of America (South Asia): VOA Morning. See S 0010.
- 0111 Radio Havana Cuba: Sports Report. The latest sports news.
- 0130 Radio Austria Int'l: Report From Austria. Magazine program, covering all aspects of Austrian life and events in the news.
- 0130 Voice of America (Americas, Caribbean): Press Conference, U.A. Correspondents ask questions of newsmakers.
- 0140 Radio Havana Cuba: DX'ers Unlimited. Arnie Coro presents shortwave radio news.

Mondays

- 0100 Radio Havana Cuba: From Havana. Culture and the arts.
- 0101 BBC: Feature/Drama. The favorite writing of celebrities "With Great Pleasure" (through September 7th).
- 0110 Voice of America (Americas, Caribbean): New Horizons. See S 1110.
- 0110 Voice of America (South Asia): Newsline. See S 2310.
- 0130 Radio Austria Int'l: Report From Austria. See S 0130.
- 0130 Radio Havana Cuba: Feature. Topical programming.
- 0130 Voice of America (Americas, Caribbean): Issues In The News. See S 1130.
- 0130 Voice of America (South Asia): VOA Morning. See S 0010.
- 0145 BBC: Feature. Traditions and rituals from Britain feature on "Rites Of Man" (3rd, 10th).

Tuesdays

- 0105 BBC: Outlook. See M 1405.
- 0110 Voice of America (Americas, Caribbean): Report To The Americas. News, interviews, and opinion.

- 0110 Voice of America (South Asia): Newsline. See S 2310.
- 0111 Radio Havana Cuba: Sports Report. See S 0111.
- 0130 BBC: Folk In Britain. Ian Anderson host, folk music.
- 0130 Radio Austria Int'l: Report From Austria. See S 0130.
- 0130 Voice of America (South Asia): VOA Morning. See S 0010.
- 0135 Radio Havana Cuba: Feature. See M 0130.
- 0145 BBC: Health Matters. Medical developments, keeping fit.
- 0155 Voice of America (Americas, Caribbean): Editorial.

Wednesdays

- 0105 BBC: Outlook. See M 1405.
- 0110 Voice of America (Americas, Caribbean): Report To The Americas. See T 0110.
- 0110 Voice of America (South Asia): Newsline. See S 2310.
- 0111 Radio Havana Cuba: Sports Report. See S 0111.
- 0130 BBC: Talks. Leslie Goffe presents a new series of "Your Questions Of Faith" (5th, 12th, 19th).
- 0130 Radio Austria Int'l: Report From Austria. See S 0130.
- 0130 Voice of America (South Asia): VOA Morning. See S 0010.
- 0135 Radio Havana Cuba: Feature. See M 0130.
- 0145 BBC: Country Style. David Allan profiles the country music scene on both sides of the pond.
- 0155 Voice of America (Americas, Caribbean): Editorial.

Thursdays

- 0105 BBC: Outlook. See M 1405.
- 0110 Voice of America (Americas, Caribbean): Report To The Americas. See T 0110.
- 0110 Voice of America (South Asia): Newsline. See S 2310.
- 0111 Radio Havana Cuba: Sports Report. See S 0111.
- 0130 BBC: Waveguide. See W 0415.
- 0130 Radio Austria Int'l: Report From Austria. See S 0130.

- 0130 Voice of America (South Asia): VOA Morning. See S 0010.
- 0135 Radio Havana Cuba: Feature. See M 0130.
- 0140 BBC: Book Choice. See W 0425.
- 0145 BBC: The Farming World. Agricultural news and technological innovations for farmers.
- 0155 Voice of America (Americas, Caribbean): Editorial. See S 1455.

Fridays

- 0105 BBC: Outlook. See M 1405.
- 0110 Voice of America (Americas, Caribbean): See T 0110.
- 0110 Voice of America (South Asia): Newsline. See S 2310.
- 0111 Radio Havana Cuba: Sports Report. See S 0111.
- 0130 BBC: Seven Seas. Malcolm Billings presents news about ships and the sea.
- 0130 Radio Austria Int'l: Report From Austria. See S 0130.
- 0130 Voice of America (South Asia): VOA Morning. See S 0010.
- 0135 Radio Havana Cuba: Feature. See M 0130.
- 0145 BBC: Global Concerns. An update on environmental issues.
- 0155 Voice of America (Americas, Caribbean): Editorial.

Saturdays

- 0105 BBC: Outlook. See M 1405.
- 0110 Voice of America (Americas, Caribbean): See T 0110.
- 0110 Voice of America (South Asia): VOA Morning. See S 0010.
- 0111 Radio Havana Cuba: Sports Report. See S 0111.
- 0130 BBC: Short Story (except 1st: Seeing Stars). See S 0430.
- 0130 Radio Austria Int'l: Report From Austria. See S 0130.
- 0135 Radio Havana Cuba: Feature. See M 0130.
- 0145 BBC: Jazz Now And Then. George Reid presents a weekly mix of new releases, old tracks, and interviews.
- 0155 Voice of America (Americas, Caribbean): Editorial.

0200 UTC

[10:00 PM EDT/7:00 PM PDT]

FREQUENCIES

0200-0225	Netherlands	9860as	11655as	13700as	0200-0300	Romania, R. Romania Int'l	5990am	6155am	9510am	9570am
0200-0230 mtwhfa	Kenya, Voice of	4935do					11830am	11940am		
0200-0230 sm	Norway	11930na			0200-0300	Russia, Radio Moscow	9470va	9530va	9685va	11710va
0200-0230	Philippines, FEBC Manila	15450as					11850va	12050va	15290va	15405va
0200-0230	Sri Lanka B'casting Corp.	6005as	9720as	15425as			15410va	15425va	15560va	17560va
0200-0230	Sweden	9695na	11705na				17570va	17635va	17685va	17730va
0200-0230	Swiss Radio Int'l	6135am	9650am	9885am	12035am		17850va	17860va	17890va	21690va
0200-0230	United Kingdom, BBC London	5975na	6005sa	6175na	6195eu	0200-0300	Sierra Leone, SLBS	3316do		
		7135as	7325na	9410eu	9580as	0200-0300	Singapore, SBC1	5010do	5052do	11940do
		9590na	9670me	9915na	11750sa	0200-0300	South Africa, Radio RSA	7270af		
		11955as	12095va	15260sa	15280as	0200-0300	Taiwan, V. of Free China,	5950na	9680na	9765pa
		15360pa	15380as	21715as			11860as	15345as		11740ca
0200-0230	USA, VOA Washington	5995am	7405am	9775am	11580am	0200-0300	Thailand	4830as	9655as	11905as
		15120am	15205am			0200-0300	USA, CS Monitor Boston	9350af	9455na	13760sa
0200-0250	Germany, Deutsche Welle	7285as	9615as	9690as	11945as	0200-0300 sa	USA, CS Monitor Boston	17555as	17865as	
		11965as	15235as	15560as		0200-0300	USA, KTN Salt Lake City	7510am		
0200-0259 twhfa	Canada, RCI Montreal	9535sa	9755sa	11845sa	11940sa	0200-0300	USA, KVOH Los Angeles	17775am		
		13720sa				0200-0300	USA, VOA Washington	7205as	9740as	11705as
0200-0300 twhf	Argentina, RAE Buenos Aires	11710am					15205as	15250as	17735as	21550as
0200-0300	Australia	15240pa	15320va	15365pa	17630as	0200-0300	USA, WHRI Noblesville	7315na		
		17715pa	17750pa	17795pa	17880as	0200-0300	USA, WINB Red Lion, Penn.	15145eu		
		21525as	21740pa	21775as		0200-0300	USA, WJCR Upton, Kentucky	7490na		
0200-0300	Australia, ABC Brisbane	4920do	9660do			0200-0300 vi	USA, WRNO New Orleans	7355am		
0200-0300	Australia, ABC Perth	6070do	9610do			0200-0300	USA, WWCR Nashville	5920na	7435am	
0200-0300	Canada, CFCX Montreal	6005do				0200-0300	USA, WYFR Okeechobee, FL	5985am	9505am	15440am
0200-0300	Canada, CFRX Toronto	6070do				0230-0245	Pakistan	9515as	15115as	17640as
0200-0300	Canada, CFVP Calgary	6030do				0230-0300	Albania, Radio Tirana	9580na	11825na	
0200-0300	Canada, CHNX Halifax	6130do				0230-0300 s	Kenya, Voice of	4935do		
0200-0300	Canada, CKZU Vancouver	6160do				0230-0300	Netherlands	9860as	11655as	13700as
0200-0300	Canada, RCI Montreal	6035eu	6125eu	7230eu	7260eu	0230-0300	Philippines, Manila	17760pa	17840pa	21580pa
		9650eu				0230-0300 twhfa	Portugal	9570am	9600am	9705am
0200-0300	Cook Islands	11760pa				0230-0300	Sri Lanka B'casting Corp.	9720as	15425as	11840am
0200-0300	Costa Rica, RFPI	7375na	13630na	21465na		0230-0300	United Kingdom, BBC London	5975na	6005sa	6175na
0200-0300	Cuba, RHC Havana	11970na	13700na					7135me	7325na	9670me
0200-0300	Ecuador, HCJB Quito	9745am	15155am	21455am				11750sa	11955me	9915na
0200-0300	Egypt, Radio Cairo	9475na	9675na					15280as	15360pa	17790va
0200-0300 as	Guam, KSDA Guam	13720as				0240-0300	Zambia, Radio 2, Lusaka	6165do	7235do	21715as
0200-0300	Hungary, Radio Budapest	6110na	9835na	11910na		0245-0300	South Korea, Seoul	9640am	11805am	15575am
0200-0300	Luxembourg, RTL	15350va				0250-0300 varies	Armenia, Radio Yerevan	11675na	15580na	
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do				0250-0300	Vatican Radio	7305na	9605na	11620na
0200-0300	Namibia BC Corp, Windhoek	3290af				0255-0300	Bonaire, TWR Bonaire	11930am		
0200-0300	New Zealand, RNZI	17770pa								

SELECTED PROGRAMS

Sundays

- 0210 Voice of America: VOA Morning. See S 0010.
 0211 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
 0215 Radio Havana Cuba: Headliners. See S 0015.
 0230 BBC: Feature. Topical programming on various subjects.
 0235 Radio Havana Cuba: World Of Sports. See S 0035.
 0240 Radio Havana Cuba: World Of Stamps. See S 0040.

Mondays

- 0200 Radio Havana Cuba: Dateline Havana. See M 0000.
 0210 Radio Havana Cuba: The Mailbag Show. See M 0010.
 0210 Voice of America: Newslines. See S 2310.
 0220 Radio Havana Cuba: The Jazz Place. See M 0020.
 0230 BBC: Composer Of The Month. Profiles of famous composers.
 0230 Voice of America: VOA Morning. See S 0010.

Tuesdays

- 0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
 0210 Voice of America (South Asia): Newslines. See S 2310.
 0211 Radio Havana Cuba: Spotlight On The Americas. See T 0011.
 0230 BBC: Quiz. See M 1215.

- 0230 Voice of America (South Asia): VOA Morning. See S 0010.
 0235 Radio Havana Cuba: Sports In Cuba. See T 0035.
 0240 Radio Havana Cuba: Let's Talk Law. See T 0040.

Wednesdays

- 0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
 0210 Voice of America (South Asia): Newslines. See S 2310.
 0211 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
 0215 Radio Havana Cuba: Headliners. See S 0015.
 0230 BBC: Development '92. Aid and development issues for developing nations.
 0230 Voice of America (South Asia): VOA Morning. See S 0010.
 0240 Radio Havana Cuba: DX'ers Unlimited. See S 0140.

Thursdays

- 0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
 0210 Voice of America (South Asia): Newslines. See S 2310.
 0211 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
 0215 Radio Havana Cuba: Headliners. See S 0015.
 0230 BBC: Sports International. Live play-by-play, interviews, features, and discussions from the sports world.

- 0230 Voice of America (South Asia): VOA Morning. See S 0010.
 0235 Radio Havana Cuba: The Way We See It. See H 0035.
 0240 Radio Havana Cuba: Cuba Today. See H 0040.

Fridays

- 0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
 0210 Voice of America (South Asia): Newslines. See S 2310.
 0211 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
 0215 Radio Havana Cuba: Headliners. See S 0015.
 0230 BBC: Drama. See H 1130.
 0230 Voice of America (South Asia): VOA Morning. See S 0010.
 0235 Radio Havana Cuba: Feature Report. See F 0035.

Saturdays

- 0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
 0210 Voice of America (South Asia): VOA Morning. See S 0010.
 0211 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
 0215 Radio Havana Cuba: Cuba Today. See H 0040.
 0230 BBC: People And Politics. The background to the British political scene.
 0235 Radio Havana Cuba: The Way We See It. See H 0035.
 0240 Radio Havana Cuba: Kaleidoscope. See A 0040.

[11:00 PM EDT/8:00 PM PDT]

0300-0315	Vatican Radio	7305na	9605na	11620na	0300-0400	Luxembourg, RTL	15350va				
0300-0325	Netherlands	9860as	11655as	13700as	0300-0400 smtwh	Malaysia, RTM Radio 4	7295do				
0300-0330	Czechoslovakia	5930na	7345na	9540na	0300-0400	New Zealand, RNZI	17770pa				
0300-0330	Egypt, Radio Cairo	9475na	9675na		0300-0400	Russia, Radio Moscow	9470va	9685va	11675va	11710va	
0300-0330	Japan NHK	5960am	15230va	15325am			11850va	12050va	15405va	15425va	
		17825am	21610am				17570va	17605va	17665va	17735va	
0300-0330	Philippines, Manila	17760pa	17840pa	21580pa			17860va	17890va	21690va		
0300-0330	United Kingdom,BBC London	3255af	5975na	6005va	0300-0400	Sierra Leone, SLBS	3316do				
		6175na	6180eu	6190af	0300-0400	Singapore, SBC1	5010do	5052do	11940do		
		7135me	7325na	9410eu	0300-0400	South Africa, Radio RSA	5960af	7270af			
		9670me	9915na	11730af	0300-0400	Sri Lanka B'casting Corp.	9720as	15425as			
		11955me	12095eu	15070af	0300-0400	Taiwan, V. of Free China,	5950na	9680na	9765as	11745as	
0300-0330	United Kingdom,BBC London	11750sa	15260sa	15310as			15345na				
0300-0330	USA, VOA Washington	5965eu	11905me	15160me	0300-0400	Tanzania	5985af	9685af	11765af		
		17895me			0300-0400	Thailand	4830as	9655as	11905as		
0300-0350	Germany, Deutsche Welle	6085na	6145na	9640na	0300-0400	Turkey, Voice of	9445na				
		11810na	11890na	13610na	0300-0400	USA, CSMonitor Boston	9350af	9455na	13760sa		
		15205na			0300-0400 sa	USA, CSMonitor Boston	17555as	17865as			
0300-0400	Australia	15240pa	15320va	15365pa	0300-0400	USA, KTBN Salt Lake City	7510am				
		17715pa	17750as	17795pa	0300-0400	USA, VOA Washington	6035af	7265af	7405af	9575af	
		21525as	21740pa	21775as			11835af	11940	15115af	17715af	
0300-0400	Australia, ABC Brisbane	4920do	9660do				21600af				
0300-0400	Australia, ABC Perth	9610do			0300-0400	USA, WHRI Noblesville	7315na				
0300-0400	Bahrain Broadcasting Svc	6010me			0300-0400	USA, WJCR Upton, Kentucky		7490na			
0300-0400	Bonaire, TWR Bonaire	9535am	11930am		0300-0400 vl, irr	USA, WRNO New Orleans	7395am				
0300-0400	Bulgaria, Radio Sofia	9850af	11720af	11765af	0300-0400	USA, WWCR Nashville	5920na	7435na			
0300-0400	Canada, CFCX Montreal	6005do			0300-0400	USA, WYFR Okeechobee, FL	5985am	9505am			
0300-0400	Canada, CFRX Toronto	6070do			0330-0400	Albania, Radio Tirana	9580na	11825na			
0300-0400	Canada, CFVP Calgary	6030do			0330-0400	Austria, ORF Vienna	9870ca	13730am			
0300-0400	Canada, CHNX Halifax	6130do			0330-0400	Japan NHK	960na	11870na	17810na		
0300-0400	Canada, CKZU Vancouver	6160do			0330-0400	Netherlands	6165na	9590na			
0300-0400	China, Radio Beijing	9690na	9770na	11715na	0330-0400	UAE Radio, Dubai	11945na	13675na	15400na	15435na	
0300-0400	Cook Islands	11760pa			0330-0400	United Kingdom,BBC London	3255af	5975na	6005af	6175va	
0300-0400	Costa Rica, RFPI	7375na	13630na	21465na			6180eu	6190af	6195eu	9410eu	
0300-0400	Costa Rica, TIFC	5055ca					9600af	9915na	11740af	11760m	
0300-0400	Cuba, RHC Havana	11970am	13700na				11955me	12095eu	15280as	15310as	
0300-0400	Ecuador, HCJB Quito	9745am	15155am	21455am			15420af	17885af	21715as		
0300-0400	Guatemala, Radio Cultural	3300do			0340-0350 mtwhfa	Greece, Voice of	9395na	9420na	11645na		
0300-0400	Honduras, HRPC Luz y Vida	3250ca		</							

0309 BBC: Words Of Faith. See S 0309.
0310 Voice of America: VOA Morning. See S 0010.
0311 Radio Havana Cuba: Sports Report. See S 0111.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: The Vintage Chart Show. Paul Burnett with past Top
20 pop music hits.
0330 Radio Austria Int'l: Report From Austria. See S 0130.
0335 Radio Havana Cuba: Feature. See M 0130.

0400 UTC

[12:00 PM EDT/9:00 PM PDT]

FREQUENCIES

0400-0415	Israel, Kol Israel	11588am			
0400-0425	Netherlands	6165na	9590na		
0400-0427	Czechoslovakia	5930na	7345na	9540na	
0400-0430	Bonaire, TWR Bonaire	9535am	11930am		
0400-0430	Bulgaria, Radio Sofia	9850eu	11720eu	15160eu	
0400-0430	Canada, RCI Montreal	9650eu	11905eu	15275me	15445me
0400-0430 varies	Croatian Radio via WHRI	7315na	9495na		
0400-0430	Cuba, RHC Havana	11760am	11970na	13700am	
0400-0430	Ecuador, HCJB Quito	9745am	15155am	21455am	
0400-0430	Guatemala, Radio Cultural	3300do			
0400-0430 sm	Norway	9560na	11865na		
0400-0430	Romania, R.Romania Int'l	5990am	6155am	9510am	9570am
		11830am	11940am		
0400-0430	Sri Lanka B'casting Corp.	9720as	15425as		
0400-0430	Swiss Radio Int'l	6135am	9885am	12035am	13635me
0400-0430	Tanzania	5985af	9685af	11765af	
0400-0430	Thailand	4830as	9655as	11905as	
0400-0430	United Kingdom,BBC London	3255af	3955eu	5975na	6180eu
		6190af	6195eu	7105af	7230eu
		7325na	9410eu	9600af	9610af
		9915na	11760me	15070va	15280as
		15310as	15420af	15590eu	17885af
0400-0430	United Kingdom,BBC London	6005af	6175am	11750va	11955me
		12095va	21715as		
0400-0450	Germany, Deutsche Welle	6130af	6145af	7150af	7225af
		9565af	9765af	11705af	11765af
		13610af	13770af		
0400-0450	North Korea	15180as	15230as	17765as	
0400-0500	Australia	15240pa	15365pa	17630as	17715pa
		17750as	17795pa	21525as	21740pa
		21775as			
0400-0500	Australia, ABC Brisbane	4920do	9660do		
0400-0500	Australia, ABC Perth	9610do			
0400-0500	Bahrain Broadcasting Svc	6010me			
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0500	China, Radio Beijing	11840na			
0400-0500	Cook Islands	11760pa			
0400-0500	Costa Rica, RFPI	7375na	13630na	21465na	

0400-0500	Kenya, Voice of	4935do			
0400-0500	Luxembourg, RTL	15350va			
0400-0500 smtwh	Malaysia, RTM Radio 4	7295do			
0400-0500 mtwhf	Namibia BC Corp, Windhoek	3270af	3290af		
0400-0500	New Zealand, RNZI	17770pa			
0400-0500	Russia, Radio Moscow	9470va	9685va	11675va	11850va
		11980va	12040va	12050va	13665va
		15210va	15320va	15405va	15425va
		15470va	15550va	17570va	17860va
		21690va	21775va		
0400-0500	Sierra Leone, SLBS	3316do			
0400-0500	Singapore, SBC1	5010do	5052do	11940do	
0400-0500	South Africa, Radio RSA	5960af	9695af		
0400-0500 vl	South Africa, Radio Oranje	3215do			
0400-0500	USA, CSMonitor Boston	9455am	9840af	9870na	13760na
		17780as			
0400-0500 sa	USA, CSMonitor Boston	17555as			
0400-0500	USA, KTNB Salt Lake City	7510am			
0400-0500	USA, KVOH Los Angeles	9785am			
0400-0500	USA, VOA Washington	5995eu	6035me	6040me	6140me
		7170eu	7200eu	9575me	9715eu
		15115me	15205me		
0400-0500	USA, WHRI Noblesville	7315na	9495sa		
0400-0500	USA, WJCR Upton, Kentucky		7490na		
0400-0500 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
0400-0500	USA, WRNO New Orleans	7395am			
0400-0500	USA, WWCR Nashville	5920na	7435na		
0400-0500	USA, WYFR Okeechobee, FL		5985am	9505am	
0400-0500	Zambia, Radio 2, Lusaka	6165do	7235do		
0415-0440	Italy, RAI, Rome	7275me	9575me		
0430-0500	Cuba, RHC Havana	11760na	11970na		
0430-0500	Nigeria	3326do	4770do		
0430-0500	Swaziland, TWR Swaziland	5055af	5965af	9655af	11750af
0430-0500	United Kingdom, BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	7230eu
		9410eu	9600af	11760me	12095va
		15070va	15280as	15310as	15400af
		15420af	15590eu	21470af	21715as
0430-0500	USA, VOA Washington	5995me	6040me	6140me	7170me
		7200me	7265me	9715me	11815me
		6180eu	6190af	6195eu	7230eu
0430-0500 s	Zambia, Radio Zambia Int'l	9505af	11880af	17895af	
0445-0500 t	Sri Lanka B' Casting Svc	9720am	15425am		
0455-0600	Nigeria, Voice of	7255af			

SELECTED PROGRAMS

Sundays

- 0410 Voice of America: VOA Morning. See S 0010.
0411 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0415 BBC: Feature. Rock 'n' roll is the fare in "Stuart Colman's Record Hop" (through September 27th).
0415 Radio Havana Cuba: Headliners. See S 0015.
0430 BBC: Short Story. Half-hour selections written by listeners (except 2nd: Seeing Stars, a monthly look at astronomy).
0435 Radio Havana Cuba: World Of Sports. See S 0035.
0440 Radio Havana Cuba: World Of Stamps. See S 0040.
0445 BBC: Talks. A ramble through the Continent features on "Keep To The Path Through Europe" (2nd, 9th).

Mondays

- 0400 Radio Havana Cuba: Dateline Havana. See M 0000.
0410 Radio Havana Cuba: The Mailbag Show. See M 0010.
0410 Voice of America: Newsline. See S 2310.
0415 BBC: Feature. Join Martin Redfern as he takes a "Journey
To The Center Of The Universe" (through September 28th).
0420 Radio Havana Cuba: The Jazz Place. See M 0020.
0430 BBC: Off The Shelf. Serialized readings from famous books.
0430 Voice of America: VOA Morning. See S 0010.
0445 BBC: Andy Kershaw's World Of Music. Exotic music from the
world over.

Tuesdays

- 0410 Voice of America: Newsline. See S 2310.

- 0411 Radio Havana Cuba: Spotlight On The Americas. See T 0011.
0415 BBC: Health Matters. See T 0145.
0430 BBC: Off The Shelf. See M 0430.
0430 Voice of America: VOA Morning. See S 0010.
0435 Radio Havana Cuba: Sports In Cuba. See T 0035.
0440 Radio Havana Cuba: Let's Talk Law. See T 0040.
0445 BBC: Talks. See M 2315.
0455 BBC: Talks. See M 2325.

Wednesdays

- 0410 Voice of America: Newslines. See S 2310.
0411 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0415 BBC: Waveguide. Tips on how to hear the BBC better.
0415 Radio Havana Cuba: Headliners. See S 0015.
0425 BBC: Book Choice. A short review of a recently released book.
0430 BBC: Off The Shelf. See M 0430.
0430 Voice of America: VOA Morning. See S 0010.
0440 Radio Havana Cuba: DX'ers Unlimited. See S 0140.
0445 BBC: Country Style. See W 0145.

Thursdays

- 0410 Voice of America: Newsline. See S 2310.
0411 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0415 BBC: The Farming World. See H 0145.

- 0415 Radio Havana Cuba: Headliners. See S 0015.
0430 BBC: Off The Shelf. See M 0430.
0430 Voice of America: VOA Morning. See S 0010.
0435 Radio Havana Cuba: The Way We See It. See H 0035.
0440 Radio Havana Cuba: Cuba Today. See H 0040.
0445 BBC: From Our Own Correspondent. See S 0330.

Fridays

- 0410 Voice of America: Newslines. See S 2310.
0411 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0415 BBC: Feature. See M 0145.
0415 Radio Havana Cuba: Headliners. See S 0015.
0430 BBC: Off The Shelf. See M 0430.
0430 Voice of America: VOA Morning. See S 0010.
0435 Radio Havana Cuba: Feature Report. See F 0035.
0445 BBC: Folk In Britain. See T 0130.

Saturdays

- 0410 Voice of America: VOA Morning. See S 0010.
0411 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0415 BBC: Good Books (except 29th: A Month In The Country). See W1445.
0415 Radio Havana Cuba: Cuba Today. See H 0040.
0430 BBC: Jazz Now And Then. See A 0145.
0435 Radio Havana Cuba: The Way We See It. See H 0035.
0440 Radio Havana Cuba: Kaleidoscope. See A 0040.
0445 BBC: Worldbrief. See F 2315.

0500 UTC

[1:00 AM EDT/10:00 PM PDT]

FREQUENCIES

0500-0510	Lesotho, Maseru	4800do		
0500-0510 w	Malawi B'casting Corp.	3381do		
0500-0515 t	Sri Lanka B'casting Svc	9720am	15425am	
0500-0530	Cameroon CRTV Beau	3970do		
0500-0530	Swaziland, TWR Swaziland	5965af	9655af	11750af
0500-0530	United Kingdom, BBC London	3255af	3955eu	6005af 6180as
			6190af	6195eu 7120eu 9410eu
			9600af	9640na 11760me 12095va
			15070as	15310as 15400af 15420af
			15590va	17885af 21470af 21715as
			5975na	15280as 15575as
0500-0530	Vatican Radio	7250eu	11625af	15090af 17730af
0500-0550	Germany, Deutsche Welle	5960na	6130na	9515na 9670na
			11705na	11925na 13610na 13790na
0500-0600	Australia	15240pa	15365pa	17630as 17715pa
			17750as	17795pa 21525as 21740pa
			21775as	
0500-0600	Australia, ABC Brisbane	4920do		9660do
0500-0600	Australia, ABC Perth	9610do		
0500-0600	Bahrain Broadcasting Svc	6010me		
0500-0600	Canada, CFCX Montreal	6005do		
0500-0600	Canada, CFRX Toronto	6070do		
0500-0600	Canada, CFVP Calgary	6030do		
0500-0600	Canada, CHNX Halifax	6130do		
0500-0600	Canada, CKZU Vancouver	6160do		
0500-0600	China, Radio Beijing	11840am		
0500-0600	Cook Islands	11760pa		
0500-0600	Costa Rica, RFI	7375na	15030na	21465na
0500-0600	Ecuador, HCJB Quito	11925am		21455am
0500-0600 sa	Eq Guinea, R. East Africa	9585af		
0500-0600 varies	Italy, IRRS Milan, Italy	7125eu		
0500-0600	Japan NHK	11870na	15195na	17765na 17810na
			17825na	17890na 21610na
0500-0600	Kenya, Voice of	4935do		
0500-0600	Luxembourg, RTL	15350va		
0500-0600	Malaysia, RTM Radio 4	7295do		
0500-0600 mtwhf	Namibia BC Corp, Windhoek	3270af	3290af	
0500-0600	New Zealand, RNZI	17770pa		
0500-0600	Nigeria	3326do	4770do	4990do 7255af
0500-0600	Russia, Radio Moscow	12050va	13665va	15405va 15425va
			17605va	
0500-0600	Sierra Leone, SLBS	3316do		
0500-0600	Singapore, SBC1	5052do		11940do

0500-0600	South Africa, Radio RSA	9695af		
0500-0600	Spanish National Radio	9530na		
0500-0600	Thailand	4830as	9655as	11905as
0500-0600	USA, CSMonitor Boston	9455na	9840af	9870na 13760na
		17780as		
0500-0600 sa	USA, CSMonitor Boston	17555as		
0500-0600	USA, KTVN Salt Lake City	7510am		
0500-0600	USA, KVOH Los Angeles	9785am		
0500-0600	USA, VOA Washington	5995eu	6040me	6060eu 6140me
		6873eu	7170me	7200me 9670me
		9700eu	9715me	11815me 11825me
		15205me		
0500-0600	USA, WHRI Noblesville	7315na		
0500-0600	USA, WINB Red Lion, Penn.	15145eu		
0500-0600	USA, WJCR Upton, Kentucky		7490na	
0500-0600 mtwhf	USA, WMLK Bethel, Penna.	9465eu		
0500-0600	USA, WWCR Nashville	5920na	7435na	
0500-0600	USA, WYFR Okeechobee, FL	5985am	9850eu	11915eu 13695af
0500-0600	Zambia, Radio 2, Lusaka	6165do	7235do	
0500-0600 s	Zambia, Radio Zambia Int'l	9505af	11880af	17895af
0510-0515 w, vl	Botswana, Gaborone	5955af	7255af	
0510-0600 vl	South Africa, Radio Oranje	9630do		
0518-0559 mtwhf	Canada, RCI Montreal	6050eu	6150eu	7295eu 9750eu
		11775me	17840me	
0520-0530	Finland, YLE	6120va	9665va	11755va 15440va
0524-0600 f	Ghana, Radio 2, Accra	3366do		
0525-0600	Ghana, Radio 1, Accra	4915do		
0530-0600	Austria, ORF Vienna	6015na	6155eu	13730eu 21490me
0530-0600	Cameroon CRTV Yaounde	4850do		
0530-0600	Romania, R. Romania Int'l	15340af	15380af	17720af 17745af
		17790af	21665af	
0530-0600	Swaziland, TWR Swaziland	5965af	11750af	
0530-0600	UAE Radio, Dubai	15435as	17830as	21700as
0530-0600	United Kingdom, BBC London	3255af	3955eu	5975na 6005af
			6180as	6190af 6195eu 7120eu
			9410eu	9600af 9640na 11760me
			12095va	15070as 15280as 15310as
			15400af	15420af 15575af 21470af
0530-0600	United Kingdom, BBC London	21470af	21715as	
0545-0600	Cameroon CRTV Beau	3970do		

SELECTED PROGRAMS

Sundays

- 0510 Voice of America: VOA Morning. See S 0010.
 0530 Radio Austria Int'l: Report From Austria. See S 0130.

Mondays

- 0510 Voice of America: Newsline. See S 2310.
 0530 Radio Austria Int'l: Report From Austria. See S 0130.
 0530 Voice of America: VOA Morning. See S 0010.

Tuesdays

- 0510 Voice of America: Newsline. See S 2310.
 0530 Radio Austria Int'l: Report From Austria. See S 0130.
 0530 Voice of America: VOA Morning. See S 0010.

Wednesdays

- 0510 Voice of America: Newsline. See S 2310.
 0530 Radio Austria Int'l: Report From Austria. See S 0130.
 0530 Voice of America: VOA Morning. See S 0010.

Thursdays

- 0510 Voice of America: Newsline. See S 2310.
 0530 Radio Austria Int'l: Report From Austria. See S 0130.

0530 Voice of America: VOA Morning. See S 0010.

Fridays

- 0510 Voice of America: Newsline. See S 2310.
 0530 Radio Austria Int'l: Report From Austria. See S 0130.



FRED DICK

One of the BBC's popular voices — Andy Smith.

0530 Voice of America: VOA Morning. See S 0010.

Saturdays

- 0510 Voice of America: VOA Morning. See S 0010.
 0530 Radio Austria Int'l: Report From Austria. See S 0130.

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0600 UTC

[2:00 AM EDT/11:00 PM PDT]

FREQUENCIES

[illegible]

SELECTED PROGRAMS

Sundays

0610 Voice of America: VOA Morning. See S 0010.
0611 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0615 BBC: Letter From America. Alistair Cooke presents his
unique reflections on the USA.
0615 Radio Havana Cuba: Headliners. See S 0015.
0630 BBC: Jazz For The Asking. Digby Fairweather plays listener
requests.
0630 Radio Austria Int'l: Austrian Coffee Table. See S 0330.
0635 Radio Havana Cuba: World Of Sports. See S 0035.
0640 Radio Havana Cuba: World Of Stamps. See S 0040.

Mondays

0600 Radio Havana Cuba: Dateline Havana. See M 0000.
0610 Radio Havana Cuba: The Mailbag Show. See M 0010.
0610 Voice of America (Africa): Daybreak Africa. See M 0310.
0610 Voice of America (Europe): Newsline. See S 2310.
0615 BBC: Recording Of The Week. A personal choice from the
new classical music releases.
0620 Radio Havana Cuba: The Jazz Place. See M 0020.
0630 BBC: Feature. See S 1401.
0630 Radio Austria Int'l: Austrian Shortwave Panorama. See S1130.
0630 Voice of America (Europe): VOA Morning. See S 0010.

Tuesdays

0610 Voice of America (Africa): Daybreak Africa. See M 0310

0610 Voice of America (Europe): Newslne. See S 2310.
0611 Radio Havana Cuba: Spotlight On The Americas. See T 001.
0615 BBC: The World Today. See M 1645.
0630 BBC: Rock/Pop Music. Paul Jones returns to present jazz,
gospel, and more on "Counterpoint" (4th, 11th).
0630 Radio Austria Int'l: Report From Austria. See S 0130.
0630 Voice of America (Europe): VOA Morning. See S 0010.
0630 Radio Havana Cuba: Sports In Cuba. See T 0035.
0640 Radio Havana Cuba: Let's Talk Law. See T 0040.

Wednesdays

0610 Voice of America (Africa): Daybreak Africa. See M 0310.
0610 Voice of America (Europe): Newslne. See S 2310.
0611 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0615 BBC: The World Today. See M 1645.
0615 Radio Havana Cuba: Headliners. See S 0015.
0630 BBC: Meridian. Events in the world of the arts.
0630 Radio Austria Int'l: Report From Austria. See S 0130.
0630 Voice of America (Europe): VOA Morning. See S 0010.
0640 Radio Havana Cuba: DX'ers Unlimited. See S 0140.

Thursdays

0610 Voice of America (Africa): Daybreak Africa. See M 0310.
0610 Voice of America (Europe): Newslne. See S 2310.
0611 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0615 BBC: The World Today. See M 1645.

0615 Radio Havana Cuba: Headliners. See S 0015.
0630 BBC: Sports International. See H 0230.
0630 Radio Austria Int'l: Report From Austria. See S 0130.
0630 Voice of America (Europe): VOA Morning. See S 0010.
0635 Radio Havana Cuba: The Way We See It. See H 0035.
0640 Radio Havana Cuba: Cuba Today. See H 0040.

Fridays

0610 Voice of America (Africa): Daybreak Africa. See M 0310.
0610 Voice of America (Europe): Newslines. See S 2310.
0611 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0615 BBC: The World Today. See M 1645.
0615 Radio Havana Cuba: Headliners. See S 0015.
0630 BBC: Meridian. See W 0630.
0630 Radio Austria Int'l: Report From Austria. See S 0130.
0630 Voice of America (Europe): VOA Morning. See S 0010.
0635 Radio Havana Cuba: Feature Report. See F 0035.

Saturdays

0610 Voice of America: VOA Morning. See S 0010.
0611 Radio Havana Cuba: Spotlight On Latin America. See S 0011.
0615 BBC: The World Today. See M 1645.
0615 Radio Havana Cuba: Cuba Today. See H 0040.
0630 BBC: Meridian. See W 0630.
0630 Radio Austria Int'l: Report From Austria. See S 0130.
0635 Radio Havana Cuba: The Way We See It. See H 0035.
0640 Radio Havana Cuba: Kaleidoscope. See A 0040.

0700 UTC

3:00 AM EDT/12:00 AM PDT]

0700-0710	Cameroon CRTV Bafoussam	4000do			
0700-0710 w	Malawi B'casting Corp.	3381do	5995do		
0700-0715	Romania, R.Romania Int'l	11810au	11940au	15335au	17720au
		17805au	21665au		
0700-0730	Australia	15170pa	15240pa	15320va	15365pa
		17715pa	17750as	21525as	21740pa
0700-0730	United Kingdom, BBC London	5975na	7150pa	9640va	11955as
		15280as	15360pa	21715as	6180eu
		7230eu	7325af	9410eu	9760eu
		12095eu	15070eu	15310as	15400af
		17640va	17790as	17885af	21470af
	North Korea			15350as	17765as
0700-0800	Bahrain Broadcasting Svc	6010me			
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Cook Islands	11760pa			
0700-0800	Costa Rica, RFPI	7375na	15030na	21465na	
0700-0800	West NA Cuba, RHC Havana	11760na			
0700-0800	Ecuador, HCJB Quito	11730eu	15270eu	21455eu	
0700-0800 sa	Eq. Guinea, R. East Africa	9585af			
0700-0800	Ghana B'casting Corp.	6130af			
0700-0800	Ghana, Radio 1, Accra	4915do			
0700-0800 f	Ghana, Radio 2, Accra	3366do			
0700-0800 varies	Italy, IRRS Milan, Italy	7125eu			
0700-0800	Japan NHK	17765me	17810as	17860as	21525as
0700-0800	Kenya, Voice of	4935do			
0700-0800	Lebanon, King of Hope	6280me			
0700-0800 tent	Liberia, ELBC Monrovia	7275do			
0700-0800	Luxembourg, RTL	15350va			
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0800	Monaco/Monte Carlo, TWR	9480eu			
0700-0800	Monte Carlo, TWR	9480eu			
0700-0800	New Zealand, RNZI	17770pa			
0700-0800 smtwhf	New Zealand, ZXLA	3935do			
0700-0800	Nigeria	3326do	4990do		
0700-0800	Russia, Radio Moscow	4740va	4950va	4975va	5960va
		7130va	7160va	7310va	9855va
		11880va	11975va	12010va	12055va
		15295va	15345va	15350va	15375va
0700-0800	Sierra Leone, SLBS	3316do			
0700-0800	Singapore, SBC1	5010do	5052do	11940do	
0700-0800 vi	South Africa, Radio Oranje	9630do			
0700-0800	Swaziland, TWR Swaziland	7200af	11750af		
0700-0800	Taiwan, V. of Free China,	5950na			
0700-0800 sa	Thailand	4830as	9655as	11905as	
0700-0800	USA, CSMonitor Boston	9445na	9840eu	9870am	17555as
		17780as			
0700-0800	USA, KTNB Salt Lake City	7510na			
0700-0800	USA, KVOH Los Angeles	9785na			
0700-0800	USA, WHRI Noblesville	7315eu			
0700-0800	USA, WJCR Upton, Kentucky		7490na		
0700-0800 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
0700-0800	USA, WWCR Nashville	5920am	7435am		
0700-0800	USA, WYFR Okeechobee, FL	9850af	11915af	13695eu	15566na
0700-0800	Zambia, Radio 2, Lusaka	6165do	7235do		
0703-0800 s	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
0705-0800 a	Cameroon CRTV Douala	4795do			
0730-0745 mtwhf	Icelandic National Radio	9265om			
0730-0745 mtwhfa	Vatican Radio	6245do	7250do	9645na	15210na
0730-0800	Australia	11880pa	15170va	15240pa	15320va
		17630as	17715pa	17750as	21525as
0730-0800	Czechoslovakia	17725pa	21705as		
0730-0800	Ecuador, HCJB Quito	9745au	11730eu	11925au	15270eu
		21455va			
0730-0800	Netherlands	9630pa	11895pa		
0730-0800	United Kingdom, BBC London	6180eu	6190af	7325eu	9410eu
		9600af	9760eu	11760me	11860af
		15070eu	15105af	15400af	15590af
		17830as	17885af	21470af	21660af
		11955as	15280as	15310as	15360pa
				17790as	21715as

0800 UTC

[4:00 AM EDT/1:00 AM PDT]

0800-0803 daily	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
0800-0810	Cameroon CRTV Bafoussam		4000do		
0800-0810 w	Malawi B'casting Corp.	3381do			
0800-0825	Finland, YLE	17800as	21550as		

0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0825	Netherlands	9630pa	11895pa		
0800-0825	Swaziland, TWR Swaziland	7200af	11750af		
0800-0830	Australia	6080pa	15240pa	17630as	17715pa
		17750as	21725as		
0800-0830	Bangladesh, V. of Islam	15195as	17815as		
0800-0830	Ecuador, HCJB Quito	9745au	11730eu	11925au	21455va
0800-0830	United Kingdom, BBC London	6180eu	6190af	7325eu	9410eu
		9600af	9760eu	11760me	11860af
		15310as	15360pa	15400af	15420af
		17830as	17885af	21470af	21660af
		9660eu	11950af	11955as	15105af
		21715as			
0800-0835	Monaco, TWR Monaco	9480eu			
0800-0835	Monte Carlo, TWR	9480eu			
0800-0845	Pakistan	17902eu	21520eu		
0800-0850	North Korea	15180as	15230as		
0800-0900	Australia, ABC Brisbane	9660do			
0800-0900	Australia, ABC Perth	15425va			
0800-0900	Bahrain Broadcasting Svc	6010me			
0800-0900 a	Cameroon CRTV Douala	4795do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Cook Islands	11760pa			
0800-0900	Costa Rica, RFPI	7375na	15030na	21465na	
0800-0900 sa	Eq. Guinea, R. East Africa	9585af			
0800-0900	Ghana, Radio 1, Accra	4915do			
0800-0900 f	Ghana, Radio 2, Accra	3366do			
0800-0900 asmtwh	Guam, KTWG Guam	15200as			
0800-0900	Indonesia, Voice of	7125as	9675as	11752as	11785as
0800-0900 varies	Italy, IRRS Milan, Italy	7125eu			
0800-0900	Kenya, Voice of	4935do			
0800-0900	Lebanon, King of Hope	6280me			
0800-0900	Luxembourg, RTL	15350va			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0900	New Zealand, RNZI	9700pa			
0800-0900 smtwhf	New Zealand, ZXLA	3935do			
0800-0900	Nigeria	3326do	4990do		
0800-0900	Nigeria, Voice of	7255af			
0800-0900	Papua New Guinea	4890do			
0800-0900	Russia, Radio Moscow	4740va	4940va	4975va	5960va
		7130va	7160va	7310va	9535va
		11920va	11975va	12010va	12055va
		15345va	15350va	15420va	15435va
0800-0900	Sierra Leone, SLBS	3316do	5980do		
0800-0900	Singapore, SBC1	5010do	5052do	11940do	
0800-0900 vi	South Africa, Radio Oranje	9630do			
0800-0900	South Korea, Seoul	7550eu	13670eu		
0800-0900	USA, CSMonitor Boston	9445am	11705eu	13615as	15665pa
		17555as			
0800-0900	USA, KNLS Anchor Point	7365as			
0800-0900	USA, KTNB Salt Lake City	7510am			
0800-0900	USA, VOA Washington	11735eu	15160eu	15195me	21455me
		21570me			
0800-0900	USA, WHRI Noblesville	7315eu	7355sa		
0800-0900	USA, WJCR Upton, Kentucky		7490na		
0800-0900 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
0800-0900	USA, WWCR Nashville	5920am	5920na		
0800-0900	Zambia, Radio 2, Lusaka	6165do	7235do		
0800-0900	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
0803-0810 tent	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
0830-0845	Vatican Radio	6245eu	7250eu	9645eu	15210eu
0830-0900	Australia	6080pa	9680pa	9710va	15240pa
		17630as	17750as	21725as	21775as
0830-0900	Austria, ORF Vienna	6155eu	13730eu	15450au	21490as
0830-0900	Ecuador, HCJB Quito	9745au	11925au	15270eu	21455au
0830-0900	Finland, YLE	15355as	17800as		
0830-0900	Italy, AWR Italy	7230eu			
0830-0900	Netherlands	9630pa	11895pa		
0830-0900	United Kingdom, BBC London	6180eu	6190eu	7325eu	9410eu
		9660eu	9760eu	11860af	11940af
		15070va	15280as	15360pa	15400af
		17640va	17830as	21660af	21715as
0835-0850 mtwhf	Monaco, TWR Monaco				
0835-0850 smtwhf	Monte Carlo, TWR				
0835-0850 mtwhf	Swaziland, TWR Swaziland	7200af	11750af		
0850-0900 s	Monaco, TWR Monaco	9480eu			
0850-0900 s	Monte Carlo, TWR	9480eu			

0900 UTC

[5:00 AM EDT/2:00 AM PDT]

0900-0903 s	Croatian Radio, Zagreb	7240eu	9830eu	21480eu
0900-0905	Ghana, Radio 1, Accra	4915do		
0900-0905 f	Ghana, Radio 2, Accra	3366do		
0900-0910	Malawi B'casting Corp.	5995do		
0900-0912 f	Guam, KTRW Guam	15200as		
0900-0915	Lebanon, Radio Voice of	6550me		
0900-0915 s	Monaco, TWR Monaco	9480eu		
0900-0915 s	Monte Carlo, TWR	9480eu		
0900-0925 mtwhf	Belgium, BRT Brussels	9905eu	13675eu	
0900-0925	Netherlands	9630pa	11895pa	
0900-0930	Costa Rica, RFPI	7375na	15030na	21465na
0900-0930 asmtwf	Guam, KTRW Guam	15200as		
0900-0930 mtwhf	New Zealand, ZLXA	3935do		
0900-0930	Swiss Radio Int'l	9560as	13685as	17670as
0900-0930	United Kingdom, BBC London	1170as	5975eu	6045eu
		6190af	6195as	7325eu
		9750eu	9760eu	11760me
		15070va	15400af	17640va
		15310as	15360as	15420af
		17790af	17830as	21470af
0900-0950	Germany, Deutsche Welle	6160as	9565af	11915as
		17780as	17820as	21465as
0900-1000	Australia	6080pa	9580pa	9710va
		15170as	21725as	
0900-1000	Australia, ABC Brisbane	9660pa		
0900-1000	Bahrain Broadcasting Svc	6010me		
0900-1000 s	Bhutan Broadcasting Svc	6035do		
0900-1000	Canada, CFCX Montreal	6005do		
0900-1000	Canada, CFRX Toronto	6070do		
0900-1000	Canada, CFVP Calgary	6030do		
0900-1000	Canada, CHNX Halifax	6130do		
0900-1000	Canada, CKZU Vancouver	6160do		
0900-1000	China, Radio Beijing	8450au	11755au	15440au
0900-1000	Cook Islands	11760pa		
0900-1000	Ecuador, HCJB Quito	9745au	11925au	21455au
0900-1000 sa	Eq Guinea, R. East Africa	9585af		
0900-1000	Guam, KTRW Guam	11805as		
0900-1000 s	Italy, AWR via Portugal	9670eu		
0900-1000 varies	Italy, IRRS Milan, Italy	7125eu		
0900-1000	Japan NHK	15270au	17890au	
0900-1000	Japan NHK	11840as	21610as	
0900-1000	Kenya, Voice of	4935do		
0900-1000	Lebanon, King of Hope	6280me		
0900-1000	Luxembourg, RTL	15350va		
0900-1000	Malaysia, RTM Radio 4	7295do		
0900-1000	New Zealand, RNZI	9700pa		
0900-1000	Nigeria	3326do	4990do	
0900-1000	Nigeria, Voice of	7255af		
0900-1000	Papua New Guinea	4890do		
0900-1000	Philippines, FEBC Manila	9800as	11685as	
0900-1000	Russia, Radio Moscow	4740do	4940do	4975do
		7130am	7245va	9535va
		11765va	11920va	11975va
		15280va	15295va	15345va
				15545na
0900-1000	Sierra Leone, SLBS	3316do		
0900-1000	Singapore, SBC1	5010do	5052do	11940do
0900-1000 vl	South Africa, Radio Oranje	9630do		
0900-1000	Tanzania	5985af	9685af	11765af
0900-1000	USA, CSMonitor Boston	9445am	11705eu	13615pa
		17555as		15665pa
0900-1000	USA, KTRN Salt Lake City	7510am		
0900-1000	USA, VOA Washington	11735eu	15160eu	15195me
		21570eu	21455me	
0900-1000	USA, WJCR Upton, Kentucky		7490na	
0900-1000 smtwhf	USA, WMLK Bethel, Penna.	9465eu		
0900-1000	USA, WWCR Nashville	5920am	7435am	
0900-1000	Zambia, Radio 2, Lusaka	6165do	7235do	
0905-1000	Cameron CRTV Yaounde	4850do		
0905-1000 sa	Ghana, Radio 1, Accra	4915do		
0905-1000 mtwhf	Ghana, Radio 2 School prg	7295do		
0905-1000 sa	Ghana, Radio 2, Accra	3366do		
0910-0940 smwha	Mongolia, Ulaanbaatar	11850pa	12015pa	
0915-0930	South Korea World News	9570am	13670eu	
0930-0940	Togo, RTV Togo	7265do		
0930-1000	Afghanistan, Kabul	9635as		
0930-1000	Netherlands	9630pa	11895pa	
0930-1000	United Kingdom, BBC London	5975eu	6045eu	6180eu
		6195as	9410eu	9660eu
		11750as	11760me	11940af
		15310as	15400af	15420af
		17790af	17885af	21470af
				21660af
				9505af
				11880af
				17895af
				15650as
				17525as
				11815am
				15345am

15400af	15420af	15575me	15590me	15190sa	17640va
17705eu					
0940-0950	Greece, Voice of	17525eu			
0950-0953 a	Russia, Vladivostok	4050do	4485do	5015do	5905do
		6035do	6175pa	7175pa	7210pa
		7345pa	9530pa	9600pa	9635pa
		11815pa	15535pa	15595pa	17620pa
		17850pa		17695pa	17825pa

1000 UTC

[6:00 AM EDT/3:00 AM PDT]

1000-1025	Netherlands	9630pa	11895pa		
1000-1030 tent	Afghanistan, Kabul	9635as			
1000-1030	Israel, Kol Israel	17545eu			
1000-1030	Tanzania	5985af	9685af	11765af	
1000-1030	United Kingdom, BBC London	5975eu	6045eu	6180eu	6190af
		6195as	9410eu	9660eu	9740as
		11750as	11760me	11940af	12095eu
		15310as	15400af	15420af	15575me
		17790af	17885af	21470af	21660af
				21470af	21715as
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1000-1100	Australia	6080pa	9580pa	9710va	11880pa
		13605pa	21725as		
1000-1100	Bahrain Broadcasting Svc	6010me			
1000-1100	Cameron CRTV Yaounde	4850do			
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, Radio Beijing	8450au	11755au	15440au	17710au
1000-1100	Cook Islands	11760pa			
1000-1100	Costa Rica, AWR	9725ca			
1000-1100	Costa Rica, RFPI	7375na	15030na	21465na	
1000-1100	Ecuador, HCJB Quito	9745au	11925au	21455au	
1000-1100 sa	Eq Guinea, R. East Africa	9585af			
1000-1100 sa	Ghana, Radio 1, Accra	4915do			
1000-1100 mtwhf	Ghana, Radio 2 School Prg	7295do			
1000-1100 sa	Ghana, Radio 2, Accra	3366do			
1000-1100	India, All India Radio	15050as	17387as	17895as	21735as
1000-1100 varies	Italy, IRRS Milan, Italy	7125eu			
1000-1100	Kenya, Voice of	4935do			
1000-1100	Luxembourg, RTL	15350va			
1000-1100	Malaysia, RTM Kuching	7160do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1100	New Zealand, RNZI	9700pa			
1000-1100	Nigeria	4990do	7285do		
1000-1100	Nigeria, Voice of	7255af			
1000-1100	Philippines, FEBC Manila	9800as	11665as		
1000-1100	Russia, Radio Moscow	9455na	9495na	11840na	15485na
1000-1100	Sierra Leone, SLBS	3316do			
1000-1100	Singapore, SBC1	5010do	5052do	11940do	
1000-1100	South Africa, Radio RSA	11900af			
1000-1100 vl	South Africa, Radio Oranje	9630do			
1000-1100	USA, CSMonitor Boston	9455am	9495na	13625as	17555as
1000-1100 sa	USA, CSMonitor Boston	15665me			
1000-1100	USA, VOA Washington	5985as	11720au	15425au	
1000-1100	USA, WHRI Noblesville	7315na			
1000-1100	USA, WJCR Upton, Kentucky		7490na		
1000-1100	USA, WWCR Nashville	5920am	15690na		
1000-1100	USA, WYFR Okeechobee, FL		5950am		
1000-1100	Zambia, Radio 2, Lusaka	6165do	7235do		
1030-1040 mtwhf	Malawi B'casting Corp.	5995do			
1030-1100	Czechoslovakia	6055va	7345va	9505va	11990va
1030-1100	Iran, Islamic Republic	9525as	11715af	11790as	11910as
		11930me			
1030-1100	South Korea, Seoul	11715na			
1030-1100	Sri Lanka B'casting Corp.	11835as	15120as	17850as	
1030-1100 sa	Tanzania	5985af	9685af	11765af	
1030-1100	UAE Radio, Dubai	13675eu	15320eu	15435as	21605as
1030-1100	United Kingdom, BBC London	5975eu	6045eu	6180eu	6190af
		6195as	9410eu	9660eu	9740as
		11750as	11760me	11940af	12095eu
		15310as	15400af	15420af	15575me
		17790af	17885af	21470af	21660af
				9505af	11880af
				15650as	17525as
				11815am	15345am

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[7:00 AM EDT/4:00 AM PDT]

FREQUENCIES

1100-1110 mtwhf	Ghana, Radio 2 School Prg	7295do				1100-1200	Malaysia, RTM Kuching	4950do	7160do			
1100-1110 sa	Malawi B'casting Corp.	5995do				1100-1200	Malaysia, RTM Radio 4	7295do				
1100-1120	Pakistan	17902eu	21520eu			1100-1200	New Zealand, RNZI	9700as				
1100-1130	Ecuador, HCJB Quito	9745au	11925au	15155au	21455au	1100-1200	Russia, Radio Moscow	9600na	11840na	12055na	15485na	
1100-1130	Iran, Islamic Republic	9525af	11515af	11790as	11910as			17830na				
		11930me				1100-1200	Singapore, SBC1	5010do	5052do	11940do		
1100-1130 irreg	Mozambique	9525af	11818af	11835af		1100-1200	South Africa, Radio RSA	11900af				
1100-1130	Sri Lanka B'casting Corp.	11835as	15120as	17850as		1100-1200 vl	South Africa, Radio Oranje	9630do				
1100-1130	Swiss Radio Int'l	13635as	15505as	17670as	21770as	1100-1200	South Korea World News	15575af				
1100-1130	United Kingdom, BBC London	5965na	6045eu	6180eu	6190af	1100-1200	USA, CS Monitor Boston	9455am	9495na	13625as	17555as	
		6195eu	9410eu	9515na	9660eu	1100-1200 sa	USA, CS Monitor Boston	15665me				
		9740as	9750eu	9760eu	11750as	1100-1200	USA, KTNB Salt Lake City	7510na				
		11760me	11940af	12095eu	15070va	1100-1200	USA, VOA Washington	5985as	6110au	9760as	11720au	
		15310as	15400af	15420af	15575me			15155au	15425as	21640as		
		15220na	17640va	17705eu	17790af	1100-1200	USA, WHRI Noblesville	7315na	9465na			
		17885af	21470af	21660af		1100-1200	USA, WJCR Upton, Kentucky	7490na				
1100-1130	Vietnam, Voice of	9840as	12020as	15010as		1100-1200	USA, WWCR Nashville	12160na	15690na			
1100-1150	Germany, Deutsche Welle	15410af	17765af	17800af	17860af	1100-1200	USA, WYFR Okeechobee, FL	5950am	7355am			
		21600af				1115-1130	South Korea World News	7275as	11740as			
1100-1150	North Korea	6576na	9977na	11335na		1115-1145	Nepal, Kathmandu	3230as	5005as	7165as		
1100-1200	Australia	6020pa	6080pa	7240pa	9580pa	1120-1130	Vatican Radio	6245do	7250do	9645do	15210do	
		9710va	11880pa	13605pa	21725as	1125-1130 sa	Botswana, Gaborone	5955af	7255af			
						1125-1150 mtwhf	Finland, YLE	15400na				
1100-1200	Bahrain Broadcasting Svc	6010me				1130-1140	Lesotho, Maseru	4800do				
1100-1200	Bonaire, TWR Bonaire	11815am	15345am			1130-1155 s	Belgium, BRT Brussels	17555va	21810na			
1100-1200	Bulgaria, Radio Sofia	11630af				1130-1200	Austria, ORF Vienna	6155eu	11780as	13730va	15450as	
1100-1200	Canada, CFCX Montreal	6005do				1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am	
1100-1200	Canada, CFRX Toronto	6070do				1130-1200	Italy, AWR Italy	7230eu				
1100-1200	Canada, CFVP Calgary	6030do				1130-1200	South Korea, Seoul	9650na				
1100-1200	Canada, CHNX Halifax	6130do				1130-1200	Thailand	4830as	9655as	11905as		
1100-1200	Canada, CKZU Vancouver	6160do				1130-1200	United Kingdom, BBC London	5965na	6045eu	6180eu	6190af	
1100-1200	Cook Islands	11760pa						6195eu	9410eu	9515na	9660eu	
1100-1200	Costa Rica, AWR	9725ca	11870ca					9740as	9750eu	9760eu	11750as	
1100-1200	Costa Rica, RFPI	7375na	15030na	21465na				11760me	11940af	12095eu	15070va	
1100-1200	Czechoslovakia	6055va	7345va	9505va	11990va			15220na	15310as	15420af	15575me	
1100-1200	Ghana, Radio 1, Accra	4915do						17640va	17705eu	17790af	17885af	
1100-1200 sa	Ghana, Radio 2, Accra	3366do						21470af				
1100-1200 varies	Italy, IRRS Milan, Italy	7125eu				1130-1200 WAR/var	Yugoslavia, Radio Federal	17710as	17740am	21605pa		
1100-1200	Japan NHK	6120na	11815sa	11840na		1145-1200	Burundi, RTV	6140af				
1100-1200	Luxembourg, RTL	15350va										

SELECTED PROGRAMS

Sundays

- 1110 Voice of America (Caribbean): Critic's Choice. News from the world of the arts.
- 1110 Voice of America (East Asia): New Horizons. The world of science, medicine, and technology.
- 1130 BBC: The Ken Bruce Show. See S 0030.
- 1130 Radio Austria Int'l: Austrian Shortwave Panorama. Developments in communications and shortwave radio news.
- 1130 Voice of America (Caribbean): Studio One. Dramatized and narrative documentaries.
- 1130 Voice of America (East Asia): Issues In The News. Members of the Washington press corps discuss current topics.

Mondays

- 1110 Voice of America (Caribbean): Focus. A look at the major figures and issues that shape contemporary life.
- 1110 Voice of America (East Asia): This Is America (Special English). A look at various unique aspects of American culture.
- 1130 BBC: Composer Of The Month. See M 0230.
- 1130 Radio Austria Int'l: Report From Austria. See S 0130.
- 1130 Voice of America (Caribbean): VOA Morning. See S 0010.
- 1130 Voice of America (East Asia): Music, USA. (Standards). Classics of American popular music.

Tuesdays

- 1110 Voice of America (Caribbean): Focus. See M 1110.

- 1110 Voice of America (East Asia) (Special English): Agriculture Report. Developments in agriculture.
- 1115 Voice of America (East Asia) (Special English): Science In The News. The role of science in everyday life.
- 1130 BBC: Megamix. Music, sports, fashion, health, travel, news, and opinion for young people.
- 1130 Radio Austria Int'l: Report From Austria. See S 0130.
- 1130 Voice of America (Caribbean): VOA Morning. See S 0010.
- 1130 VOA (East Asia): Now Music, USA. Rock and soul music from old favorites to the latest hits, and profiles of the stars.

Wednesdays

- 1110 Voice of America (Caribbean): Focus. See M 1110.
- 1110 Voice of America (East Asia): Science Report (Special English). See M 0040.
- 1115 Voice of America (East Asia): Space And Man (Special English). Various aspects of life in space.
- 1130 BBC: Meridian. See W 0630.
- 1130 Radio Austria Int'l: Report From Austria. See S 0130.
- 1130 Voice of America (Caribbean): VOA Morning. See S 0010.
- 1130 Voice of America (East Asia): Now Music, USA. See T 1130.

Thursdays

- 1110 Voice of America (Caribbean): Focus. See M 1110.
- 1110 Voice of America (East Asia): Science Report (Special English). See M 0040.
- 1115 Voice of America (East Asia): The Making Of A Nation (Special English). See H 0045.

- 1130 BBC: Drama. When a widow steps out into the "real world," it's "Mrs. Donaldson at 60" (6th).
- 1130 Radio Austria Int'l: Report From Austria. See S 0130.
- 1130 Voice of America (Caribbean): VOA Morning. See S 0010.
- 1130 Voice of America (East Asia): Now Music, USA. See T 1130.

Fridays

- 1110 Voice of America (Caribbean): Focus. See M 1110.
- 1110 Voice of America (East Asia): Science Report (Special English). See M 0040.
- 1115 Voice of America (East Asia): American Mosaic (Special English). A feature program in s-l-o-w English.
- 1130 BBC: Meridian. See W 0630.
- 1130 Radio Austria Int'l: Report From Austria. See S 0130.
- 1130 Voice of America (Caribbean): VOA Morning. See S 0010.
- 1130 Voice of America (East Asia): Country Music, USA. Current popular country music tunes with a sprinkling of old favorites.

Saturdays

- 1110 Voice of America: Agriculture Today. Developments in agriculture.
- 1130 BBC: Meridian. See W 0630.
- 1130 Radio Austria Int'l: Austrian Coffee Table. See S 0330.
- 1130 Voice of America (Caribbean): Music, USA. (Standards). See M 1130.
- 1130 Voice of America (East Asia): Press Conference, USA. See S 0130.

[8:00 AM EDT/5:00 AM PDT]

1200-1205	New Zealand, RNZI	9700as			
1200-1210 w	Malawi B'casting Corp.	3381do	5995do		
1200-1215	Cambodia, Voice of	9695as	11938as		
1200-1225 sa	Ghana, Radio 2, Accra	3366do			
1200-1230	Bulgaria, Radio Sofia	11630af			
1200-1230 smwha	Mongolia, Ulaanbaatar	11850as	12015as		
1200-1230 as	Norway	17860as	21705as		
1200-1230	Somalia, Radio Mogadishu,	6095af			
1200-1230	Thailand	4830as	9655as	11905as	
1200-1230	United Kingdom, BBC London	6045eu	180eu	6190af	6195eu
		9410eu	9515na	9660eu	9740na
		9750eu	9760eu	11750as	11760me
		11940af	12095eu	15070eu	15220na
		15310as	15420af	15575me	17640va
		17705eu	17790af	17840af	17885af
		21470af	21660af		
1200-1230	USA, VOA Washington	6110as	9760au 1	1715as	15155au
		15425as			
1200-1230	Uzbekhistan, R. Tashkent	5945as	9540as	15470as	17745as
1200-1230 s	Zambia, Radio Zambia Int'l	9505af	11880af	17895af	
1200-1255	Polish Radio Warsaw	6135eu	7145eu	9525eu	11815eu
1200-1300	Australia	6020pa	6080pa	7240pa	9580pa
		9710pa	21725as		
1200-1300	Australia, ABC Brisbane	4920au			
1200-1300	Australia, ABC Katherine	2485do			
1200-1300	Australia, ABC Perth	6140do	9610do		
1200-1300	Bahrain Broadcasting Svc	6010me			
1200-1300	Bonaire, TWR Bonaire	11815am	15345am		
1200-1300	Brazil, Radiobras	11745am			
1200-1300 mtwhf	Cameroon CRTV Douala	4795do			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1300 mtwhf	Canada, RCI Montreal	9635am	11855am	17820am	
1200-1300	China, Radio Beijing	8425au	9665na	9715as	11600pa
		11660as	15450pa		
1200-1300	Cook Islands	11760pa			
1200-1300	Costa Rica, AWR	9725ca	11870ca		
1200-1300	Costa Rica, RFPI	13630na	15030na	21465na	
1200-1300	Ecuador, HCJB Quito	11925am	15115am	17890am	21455om
1200-1300 sa	Eq. Guinea, R. East Africa	9585af			
1200-1300	Ghana, Radio 1, Accra	4915do			
1200-1300 varies	Italy, IRRS Milan, Italy	7125eu			
1200-1300	Kenya, Voice of	4935do			

1200-1300	Luxembourg, RTL	15350va			
1200-1300	Malaysia, RTM Radio 4	7295do			
1200-1300	Nigeria	4990do	7285do		
1200-1300	Nigeria, Voice of	7255af			
1200-1300	Papua New Guinea	4890do			
1200-1300	Russia, Radio Moscow	9655na	9755na	11840na	11985na
		12050na	12055na	15280na	15485na
		17670na	17830na		
1200-1300	Sierra Leone, SLBS	3316do	5980do		
1200-1300	Singapore, SBC1	5010do	5052do	11940do	
1200-1300 vl	South Africa, Radio Oranje	9630do			
1200-1300 sa	Tanzania	5985af	9684af	11765af	
1200-1300 mtwhf	Uganda, Kampala O'seas Sv	15325na			
1200-1300	USA, CSMonitor Boston	9425au	9495am	13625as	13760na
1200-1300 as	USA, CSMonitor Boston	15665eu			
1200-1300	USA, KTVN Salt Lake City	7510am			
1200-1300	USA, WHRI Noblesville	7315am			
1200-1300	USA, WJCR Upton, Kentucky		7490na		
1200-1300	USA, WWCN Nashville	12160na	15690na		
1200-1300	USA, WYFR Okeechobee, FL	5950am	6015am	11830am	17760am
1203-1210 as	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
1215-1230	Cyprus, Radio Bayrak	6150va			
1215-1300	Egypt, Radio Cairo	17595as			
1215-1300	South Korea, Seoul	9750am			
1226-1300	Ghana, Radio 2, Accra	7295do			
1230-1255 mtwhf	Finland, YLE	15400na	17880na		
1230-1300	Bangladesh	15200as	15605as	15647as	17750as
1230-1300	France, RFI Paris	9805eu	11670eu	15195eu	15365eu
		15425eu	21645na		
1230-1300	Netherlands	9855eu			
1230-1300	Sri Lanka B'casting Corp.	6075as	9720as		
1230-1300	Sweden	15170as	17740as		
1230-1300	United Kingdom, BBC London	6045eu	6180eu	6190af	6195ca
		9410eu	9515na	9660eu	9740na
		9750eu	9760eu	11760me	11940af
		12095eu	12170as	15070eu	15220na
		15310as	15420af	15575me	17640va
		17705eu	17790af	17840af	17885af
		21470af	21660af		
1230-1300	USA, VOA Washington	6110as	9760au	11715au	15155as
		15425as			
1230-1300	Vietnam, Voice of	9840as	12020as	15010as	
1235-1245	Greece, Voice of	15635na	15650na	17515na	

1201 BBC: Play Of The Week. See S 0101.
1210 Voice of America: Encounter A discussion program presenting opinions on world issues.
1230 Voice of America: Studio One. See S 1130.

1210 Voice of America: Newslines. See S 2310.

1215 BBC: Quiz. Robert Robinson hosts the favorite general-knowledge game show "Brain Of Britain" (through October 4th).

1230 Voice of America: Magazine Show. Features about culture, science, sports, medicine, and the arts in America.

1245 BBC: Sports Roundup. See S 0315.

1210 Voice of America: Newslines. See S 2310.
1215 BBC: Multitrack 1: Top 20. See M 2330.
1230 Voice of America: Magazine Show. See M 1230.

1245 BBC: Sports Roundup. See S 0315.

1210 Voice of America: Newslines. See S 2310.
1215 BBC: New Ideas. See M 1615.
1230 Voice of America: Magazine Show. See M 1230.
1235 BBC: Talks. See M 1635.
1245 BBC: Sports Roundup. See S 0315.

1210 Voice of America: Newslines. See S 2310.
1215 BBC: Multitrack 2. See W 2330.
1230 Voice of America: Magazine Show. See M 1230.
1245 BBC: Sports Roundup. See S 0315.

1210 Voice of America: Newslne. See S 2310.
1215 BBC: Feature. Jim Hiley examines "The Gay And Lesbian World"(7th, 14th, 21st).
1230 Voice of America: Magazine Show. See M 1230.
1245 BBC: Sports Roundup. See S 0315.

1210 Voice of America: Communications World. See S 0110.
1215 BBC: Multitrack 3. See F 2330.
1230 Voice of America: Weekend Magazine. See S 0030.
1245 BBC: Sports Roundup. See S 0315.

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FOR MORE INFORMATION AND RATES WRITE:

JACQUES d'AVIGNON
459 LEITCH DRIVE, CORNWALL, ONTARIO
CANADA K6H 5P7

COMPUERVE: 70531.140

1300 UTC

[9:00 AM EDT/6:00 AM PDT]

FREQUENCIES

1300-1315	South Korea, Seoul	9750na			
1300-1320	Brazil, Radiobras	11745am			
1300-1325	Belgium, BRT Brussels	17555va	21810na		
1300-1325	Kenya, Voice of	4935do			
1300-1325	Netherlands	9855eu			
1300-1330	Afghanistan, Kabul	9635as			
1300-1330	Bonaire, TWR Bonaire	11815am	15345am		
1300-1330 mtwhf	Cameroon CRTV Douala	4795do			
1300-1330	Egypt, Radio Cairo	17595as			
1300-1330 as	Finland, YLE	15400na	17880na		
1300-1330	Israel, Kol Israel	11587am	11605na	15590na	15640as
		15650as	17575eu	17590eu	
1300-1330 as	Norway	9590eu	15270af		
1300-1330	Swiss Radio Int'l	6165eu	7480as	9535eu	11690as
		12030eu	13635as	15505as	17670as
		21770as			
1300-1330	United Kingdom, BBC London	5965am	6180eu	6190af	6195ca
		9410eu	9515na	9660eu	9740as
		9750eu	9760eu	11750as	11760me
		11820as	11940af	12095eu	15070va
		15220na	15310as	15420af	15575me
		7180as	15220na	17640va	17705eu
		17790af	17840af	17885af	21470af
		21660af			
1300-1330	USA, VOA Washington	6110as	9760au	11715as	15155au
		15425au			
1300-1350	North Korea	9325eu	9345eu	9640as	13650as
		13650am	15230as	15230am	
1300-1400	Australia	5995pa	6080pa	7240pa	9580pa
		11800pa			
1300-1400	Australia, ABC Alice Sprg	2310do			
1300-1400	Australia, ABC Brisbane	4920do			
1300-1400	Australia, ABC Katherine	2485do			
1300-1400	Australia, ABC Perth	9610do			
1300-1400	Australia, ABC Tennant Cr	2325do			
1300-1400	Bahrain Broadcasting Svc	6010me			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400 s	Canada, RCI Montreal	11955am	17820am		
1300-1400	China, Radio Beijing	9715as	11660va	11855na	
1300-1400	Cook Islands	11760pa			
1300-1400	Costa Rica, RFPI	13630na	15030na	21465na	
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1300-1400 sa	Eq. Guinea, R. East Africa	9585af			
1300-1400	Ghana, Radio 1, Accra	4915do			
1300-1400	Ghana, Radio 2, Accra	7295do			
1300-1400	Luxembourg, RTL	15350va			
1300-1400	Malaysia, RTM Radio 4	7295do			
1300-1400	Nigeria	4990do	7285do		
1300-1400	Nigeria, Voice of	7255af			
1300-1400	Papua New Guinea	4890do			
1300-1400	Philippines, FEBC Manila	11995as			
1300-1400	Romania, R. Romania Int'l	11940eu	15365eu	17720eu	17850eu
1300-1400	Russia, AWR Russia	11855as			
1300-1400	Russia, Radio Moscow	7370va	9655na	9755na	11840na
		11870va	11985na	11995va	12050na
		12055na	15485na	17670na	17830na
1300-1400	Sierra Leone, SLBS	3316do	5980do		
1300-1400	Singapore, SBC1	5010do	5052do	11940do	
1300-1400 vl	South Africa, Radio Oranje	9630do			
1300-1400	Sri Lanka B'casting Corp.	6075as	9720as		
1300-1400 sa	Tanzania	5985af	9684af	11765af	
1300-1400	USA, CSMonitor Boston	9425au	9495am	13625as	13760na
1300-1400 as	USA, CSMonitor Boston	15665eu			
1300-1400	USA, KNLS Anchor Point	11580as			
1300-1400	USA, KTNB Salt Lake City	7510am			
1300-1400	USA, WHRI Noblesville	9465na	11790na		
1300-1400	USA, WJCR Upton, Kentucky		7490na		
1300-1400	USA, WWCR Nashville	12160na	15690		
1300-1400	USA, WYFR Okeechobee, FL	5950am	6015am	11550as	11830am
		13695na	17760am		
1315-1330	Lebanon, Radio Voice of	6549.5			
1320-1400	Jordan	9560eu			
1325-1400 mtwhf	Kenya, Voice of	4935do			
1330-1345	South Korea World News	7275as	11740as		
1330-1357	Canada, RCI Montreal	9535as	11795as		
1330-1400	Austria, ORF Vienna	11780as	15450as		
1330-1400	Cameroon CRTV Douala	4795do			
1330-1400	Finland, YLE	15400na	17880na		
1330-1400	India, All India Radio	9665as	11760as	15120as	
1330-1400 a	Indonesia, Radio Republik	3385do	6070do		
1330-1400	Laos, National Radio of	7116as			
1330-1400	Netherlands	17580pa	17605pa	21665pa	
1330-1400	UAE Radio, Dubai	13675eu	15320eu	15435as	21605as
1330-1400	United Kingdom, BBC London	5975eu	6045eu	6180eu	6190af
		6195ca	9410eu	9515na	9660eu
		9740as	9750eu	9760eu	11750as
		11820as	11940af	12095eu	15070va
		15220na	15310as	15420af	15575me
		7180as	17640va	17705eu	17790af
		17840af	17885af	21470af	21660af
1330-1400	USA, VOA Washington	6110as	9760as	15155au	15425au
1330-1400	Uzbekistan, R. Tashkent	5945as	9540as	15470as	17745as
1330-1400	Vietnam, Voice of	9840as	12020as	15010as	
1345-1400	Vatican Radio	11640au	15090au	17525au	21515au

SELECTED PROGRAMS

Sundays

- 1310 Voice of America: Critic's Choice. News from the world of the arts.
- 1330 Radio Austria Int'l: Austrian Shortwave Panorama. See S1130.
- 1340 Voice of America: Words And Their Stories (Special English). See S 0040.
- 1345 Voice of America: Tuning In The USA (Special English). A feature program in s-t-o-w English.

Mondays

- 1310 Voice of America: Focus. See M 1110.
- 1330 Radio Austria Int'l: Report From Austria. See S 0130.
- 1340 Voice of America: Development Report (Special English). Program details not available at press time.
- 1345 Voice of America: This Is America (Spec Eng). See M 1115.

Tuesdays

- 1310 Voice of America: Focus. See M 1110.
- 1330 Radio Austria Int'l: Report From Austria. See S 0130.
- 1340 Voice of America (Spec Eng): Agriculture Report. See T 1110.
- 1345 Voice of America (Spec Eng): Science In The News. See T 1115.

Wednesdays

- 1310 Voice of America: Focus. See M 1110.
- 1330 Radio Austria Int'l: Report From Austria. See S 0130.
- 1340 Voice of America: Science Report (Spec Eng). See M0040.
- 1345 Voice of America: Space And Man (Spec Eng). See W 1115.

Thursdays

- 1310 Voice of America: Focus. See M 1110.
- 1330 Radio Austria Int'l: Report From Austria. See S 0130.
- 1340 Voice of America: Science Report (Spec Eng). See M0040.

- 1345 Voice of America: The Making Of A Nation (Spec Eng). See H 0045.

Fridays

- 1310 Voice of America: Focus. See M 1110.
- 1330 Radio Austria Int'l: Report From Austria. See S 0130.
- 1340 Voice of America: Science Report (Spec Eng). See M0040.
- 1345 Voice of America: American Mosaic (Spec Eng). See F 1115.

Saturdays

- 1310 Voice of America: On The Line. See S 0010.
- 1330 Radio Austria Int'l: Austrian Coffee Table. See S 0330.
- 1340 Voice of America: Words And Their Stories (Special English). See S 0040.
- 1345 Voice of America: American Stories (Spec Eng). See S 0045.

[10:00 AM EDT/7:00 AM PDT]

1400-1410	Malawi B'casting Corp.	3381do			
1400-1410	Sudan, Radio Juba	9540do	9550do		
1400-1415	Vatican Radio	15090au	17525au	21515au	
1400-1425	Netherlands	17580pa	17605pa	21665pa	
1400-1430	Cameroon CRTV Douala	4795do			
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1400-1430	Malaysia, RTM Kuching	4950do			
1400-1430	United Kingdom, BBC London	6190af	6195af	6195as	7180as
		9410eu	9515na	9660eu	9740as
		9750eu	9760eu	11750as	11820as
		11940af	12095eu	15070eu	15220na
		15310as	15575me	17640va	17705eu
		17790af	17840na	17880af	21470af
		21660af			
1400-1500	Australia	5995pa	6060pa	6080pa	7240pa
		9540pa	9580pa	9770va	11800na
		15170va			
1400-1500	Australia, VLW6 Wanneroo,	6140do			
1400-1500	Bahrain Broadcasting Svc	6010me			
1400-1500	Cameroon CRTV Yaounde	4850do			
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500 s	Canada, RCI Montreal	11955am	17820am		
1400-1500	China, Radio Beijing	4200as	11815as	11855na	15165as
1400-1500	Cook Islands	11760pa			
1400-1500	Costa Rica, RFPI	13630na	15030am	21465am	
1400-1500	France, RFI Paris	11910as	17650as	17695as	
1400-1500	Ghana, Radio 1, Accra	4915do			
1400-1500	Ghana, Radio 2, Accra	7295do			
1400-1500	India, All India Radio	9665as	11760as	15120as	
1400-1500 varies	Italy, IRRS Milan, Italy	7125eu			
1400-1500	Japan NHK	9505am	11865va		
1400-1500	Jordan	9560eu			
1400-1500 mtwhf	Kenya, Voice of	4935do			
1400-1500	Lebanon, King of Hope	6280me			
1400-1500	Luxembourg, RTL	15350va			
1400-1500	Malaysia, RTM Radio 4	7295do			
1400-1500	Malta, V. of the Medit.	11925eu			
1400-1500	Nigeria	4990do	7285do		
1400-1500	Nigeria, Voice of	7255af			

1400-1500	Philippines, FEBC Manila	11995as			
1400-1500	Russia, Radio Moscow	7370va	9655na	9675na	9755na
		11840na	11870va	11995na	12015va
		12030va	12050na	15435na	15485na
		15490va	15580va	17670na	17695va
		17810va	21690na		
1400-1500	Sierra Leone, SLBS	3316do	5980do		
1400-1500	Singapore, SBC1	5010do	5052do	11940do	
1400-1500 vl	South Africa, Radio Oranje	9630do			
1400-1500	South Korea, Seoul	9570as			
1400-1500	Sri Lanka B'casting Corp.	6075as	9720as		
1400-1500 sa	Tanzania	5985af	9684af	11765af	
1400-1500	USA, CSMonitor Boston	9530as	13625as	13760am	15665eu
		17555am			
1400-1500 sa	USA, CSMonitor Boston	13710na			
1400-1500	USA, KTVN Salt Lake City	7510na			
1400-1500	USA, VOA Washington	6110as	9760as	15160au	15425au
1400-1500	USA, WHRI Noblesville	9465na	15105na		
1400-1500	USA, WJCR Upton, Kentucky		7490na		
1400-1500	USA, WWCR Nashville	15690am	17535na		
1400-1500	USA, WYFR Okeechobee, FL	6015am	11550as	11830am	17760am
1405-1430	Finland, YLE	6120va	6155eu	9730af	11755eu
		11820va	15440me	17880eu	
1415-1425	Nepal, Kathmandu	3230do	5005do	7165do	
1415-1429	Canada, RCI Montreal	11935eu	15305eu	15315eu	15325eu
		17795eu	17820eu	21545eu	
1415-1500	Bhutan Broadcasting Svc	5023do			
1430-1500	Albania, Radio Tirana	7155eu	9760eu		
1430-1500	Austria, ORF Vienna	6155va	11780va	13730va	21490va
1430-1500 mtwhfa	Cameroon CRTV Douala	4795do			
1430-1500	Ecuador, HCBV Quito	11925am	17890am	21455am	
1430-1500	Myanmar, Voice of, Burma	5990do			
1430-1500	Netherlands	9890as	15150as	17605as	21665as
1430-1500	Romania, R.Romania Int'l	11775as	15335as	17720as	
1430-1500	United Kingdom, BBC London	6180eu	6190af	6195as	9410eu
		9515na	9740as	9750eu	9760eu
		11750as	11820as	11940af	12095eu
		15070va	15310as	15575me	17640va
		17705eu	17790af	17840va	17880af
		7180as	21470af	21660af	
		9540om			
1440-1450 mtwhfa	Venezuela, Radio Nacional	7260as	13780as		
1445-1500 smwha	Mongolia, Ulaanbaatar				

1405 BBC: Outlook. See M 1405.

1401 BBC: Sportsworld. The latest soccer, cricket, tennis, golf,
and more.

1410 Voice of America: Music, USA. (Jazz). Willis Conover looks
at jazz of yesterday and today, in the USA. and abroad.

1430 Radio Austria Int'l: Report From Austria. See S 0130.

1455 Voice of America: Editorial. See S 1455.

1500 UTC

[11:00 AM EDT/8:00 AM PDT]

FREQUENCIES

1500-1515 smwha	Mongolia, Ulaanbaatar	7260as	13780as		
1500-1525	Netherlands	9890as	15150as	17605as	21665as
1500-1530 mtwhf	Portugal	21515me			
1500-1530	Romania, R. Romania Int'l	11775as	15335as	17720as	
1500-1530	Sweden	15270va	17870na	21500na	
1500-1530	Swiss Radio Int'l	13635as	15505as	17670as	21770as
1500-1530 sa	Tanzania	5985af	9684af	11765af	
1500-1530	United Kingdom, BBC London	3915as	5975eu	6045eu	6180eu
		6190af	6195eu	6195as	9410eu
		9515na	9740na	9750eu	9760eu
		11750as	11940af	12095eu	15070va
		15310as	15400af	15420af	17840na
		15260na	15575me	17640va	17705eu
		17790af	17860af	17880af	21470af
		21490af	21660af		
1500-1550	Germany, Deutsche Welle	9735af	11965af	13610af	17735af
		17765af	21600af		
1500-1550	North Korea	9325eu	9640af	9977af	11705eu
1500-1555	Polish Radio Warsaw	7285eu	9525eu	11840eu	
1500-1555	Seychelles, FEBA	9810as	11685af	15330as	
1500-1600	Australia	5995pa	6060pa	6080pa	7240pa
		9540pa	9580pa	9770pa	11800pa
		12000pa	13755pa	15170as	17565as
1500-1600	Bahrain Broadcasting Svc	6010me			
1500-1600	Bangladesh	4880do			
1500-1600	Cameroon CRTV Yaounde	4850do			
1500-1600	Canada, CFCX Montreal	6005do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, CHNX Halifax	6130do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, RCI Montreal	11955am	17820am		
1500-1600	China, Radio Beijing	7405na	11815as	15165as	
1500-1600	Cook Islands	11760pa			
1500-1600	Costa Rica, RFPI	13630na	15030am	21465am	
1500-1600	Ecuador, HCJB Quito	11925am	17890am	21455am	
1500-1600	Ethiopia, Voice of	7165af			
1500-1600	Ghana, Radio 1, Accra	4915do			
1500-1600	Ghana, Radio 2, Accra	7295do			
1500-1600	Guam, KTWR Guam	11650as			
1500-1600	Japan NHK	11865am			
1500-1600	Jordan	9560eu			
1500-1600 mtwhf	Kenya, Voice of	4935do			

1500-1600	Luxembourg, RTL	15350va			
1500-1600	Malaysia, RTM Radio 4	7295do			
1500-1600	Malta, V. of the Medit.	11925eu			
1500-1600	Myanmar, Voice of, Burma	5990do			
1500-1600	Nigeria	4990do	7285do		
1500-1600	Nigeria, Voice of	7255af			
1500-1600	Philippines, FEBC Manila	11995as			
1500-1600	Russia, Radio Moscow	7370va	9655na	9755na	11665na
		11840na	11995na	12015va	12030na
		12050na	13645na	15405na	15485na
		17670na			
1500-1600 twhfa	Seychelles, FEBA	9810as	15330as		
1500-1600	Sierra Leone, SLBS	3316do	5980do		
1500-1600	Singapore, SBC1	5010do	5052do	11940do	
1500-1600 vl	South Africa, Radio Oranje	9630do			
1500-1600	Sri Lanka B'casting Corp.	6075as	9720as		
1500-1600	USA, CSMonitor Boston	9530as	13625as	13760pa	15665eu
		17555am			
1500-1600 sa	USA, CSMonitor Boston	13710na			
1500-1600	USA, KTN Salt Lake City	15590na			
1500-1600	USA, VOA Washington	6110as	7125as	9645as	9760as
		15395as			
1500-1600	USA, VOA Washington	9700eu	15205me		
1500-1600	USA, WHRI Noblesville	9465sa			
1500-1600	USA, WJCR Upton, Kentucky		7490na		
1500-1600 vl, irr	USA, WRNO New Orleans	15420na			
1500-1600	USA, WWCR Nashville	15690am	17535na		
1500-1600	USA, WYFR Okeechobee, FL	11705am	11830am		
1522-1535	Taiwan, Voice of	9910as			
1530-1540 mtwhfa	Greece, Voice of	15630na	15650na	17525na	
1530-1600	Austria, ORF Vienna	6155eu	11780as	13730eu	21490va
1530-1600	Netherlands	9890as	15150as	17580as	17605as
		21665as			
1530-1600	Sudan Nat'l B'casting Cor	9540do	9550do	11635do	
1530-1600	Switzerland, SRI	15430va			
1530-1600	Tanzania	5985af	9684af	11765af	
1530-1600	United Kingdom, BBC London	6190af	6195eu	6195as	7180as
		9410eu	9740na	9750eu	11750as
		11775na	12095eu	15070va	15260as
		15310as	15400af	17640va	17705eu
		17840na	17880af	21470af	21660af
1545-1600	South Korea World News	7275va			
1545-1600	Vatican Radio	15090au	17865au		

SELECTED PROGRAMS

Sundays

- 1510 Voice of America: New Horizons. See S 1110.
 1515 BBC: From The Proms. Highlights of the annual concert series from London's Royal Albert Hall (except 2nd, 9th: Sunday Sportsworld, special Olympics coverage).
 1530 Radio Austria Int'l: Austrian Shortwave Panorama. See S 1130.
 1530 Voice of America: Studio One. See S 1130.

Mondays

- 1510 Voice of America: Newline. See S 2310.
 1515 BBC: Feature/Drama. See M 0101.
 1530 Radio Austria Int'l: Report From Austria. See S 0130.
 1530 Voice of America: Magazine Show. See M 1230.

Tuesdays

- 1510 Voice of America: Newline. See S 2310.
 1515 BBC: A Jolly Good Show. Dave Lee Travis presents listener rock music requests.
 1530 Radio Austria Int'l: Report From Austria. See S 0130.
 1530 Voice of America: Magazine Show. See M 1230.



HCJB's goal is "to proclaim Christ, in His power with love and excellence."

Wednesdays

- 1510 Voice of America: Newline. See S 2310.
 1515 BBC: Talks. See M 0415.
 1530 BBC: Comedy/Drama. A new comedy series on a young writer? It's "The Nick Revell Show" (5th, 12th).
 1530 Radio Austria Int'l: Report From Austria. See S 0130.
 1530 Voice of America: Magazine Show. See M 1230.

Thursdays

- 1510 Voice of America: Newline. See S 2310.
 1515 BBC: Music. See S 2315.
 1530 Radio Austria Int'l: Report From Austria. See S 0130.
 1530 Voice of America: Magazine Show. See M 1230.

Fridays

- 1510 Voice of America: Newline. See S 2310.
 1515 BBC: Music Review. See H 2315.
 1530 Radio Austria Int'l: Report From Austria. See S 0130.
 1530 Voice of America: Magazine Show. See M 1230.

Saturdays

- 1510 Voice of America: Close-Up. Program details not available at press time.
 1515 BBC: Sportsworld. See A 1430.
 1530 Radio Austria Int'l: Austrian Coffee Table. See S 0330.
 1530 Voice of America: Press Conference, UA. See S 0130.

shortwave guide

1700 UTC

[1:00 PM EDT/10:00 AM PDT]

1700-1705	Ghana, Radio 2, Accra	7295do			
1700-1710	Cameroon CRTV Bafoussam	4000do			
1700-1715	Israel, Kol Israel	11587na	11675eu	15590af	15650va
1700-1728	Sierra Leone, SLBS	3316do	5980do		
1700-1730 mtwhf	Canada, RCI Montreal	5995eu	7235eu	13650eu	15325eu
		17820eu	21545eu		
1700-1730 as	Norway	9655eu			
1700-1730	Sri Lanka B'casting Corp.	6075as	9720as		
1700-1730	Swaziland, TWR Swaziland	3200af	9520af		
1700-1730	Swiss Radio Int'l	13635af	15430af	17635af	21770af
1700-1730	United Kingdom, BBC London	9515na	15260na	17895af	21470af
	21660af	3915as	5975as	6005af	6180eu
	6195eu	9410eu	9630af	9740eu	11750as
	12095eu	15070eu	15310as	15400af	15420af
	17695eu	17860af	17880af		17640va
1700-1730	USA, VOA Washington	3980eu	6040me	9575af	9700eu
		9760me	11920af	15205me	15410af
		15445af	15495af	15580af	17650af
		17800af	21625af		
1700-1750	North Korea	9325eu	9640af	9977af	11705eu
1700-1755	Polish Radio Warsaw	7270eu	9525eu		
1700-1800	Algeria, R. Algiers	17745na			
1700-1800	Australia	5995pa	6060pa	6080pa	9540pa
		9580pa	9860pa	11910pa	12000pa
		13755pa	15170as		
1700-1800	Bahrain Broadcasting Svc	6010me			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, Radio Beijing	4130af	8260af	9570af	11575af
		15345af			
1700-1800	Cook Islands	11760pa			
1700-1800	Costa Rica, RFPI	13630na	15030na	21465na	
1700-1800	Ecuador, HCJB Quito	15270me	17790me	21455me	
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800 sa	Eq. Guinea, R. East Africa	7190af			
1700-1800	Ghana, Radio 1, Accra	4915do			
1700-1800	Guam, KSDA Guam	13720af			
1700-1800 varies	Italy, IRRS Milan, Italy	7125eu			
1700-1800	Japan NHK	7140as	11815na	11865na	15210me
		15345me			
1700-1800 mtwhf	Kenya, Voice of	4935do			
1700-1800	Luxembourg, RTL	15350va			
1700-1800 smtwhf	New Zealand, RNZI	9675pa			
1700-1800	Nigeria	3326do	4990do		
1700-1800	Nigeria, Voice of	7255af			
1700-1800	Pakistan	11570eu	15550eu		
1700-1800	Russia, Radio Moscow	11840na	11900va	11940va	11995na
		12030na	12050na	13645na	13665va
		15375na	15425na	15580na	17670na
		17695na	17710na		
1700-1800	Saudi Arabia BC Svc	9705eu	9720eu		
1700-1800	South Africa, Radio RSA	9565af	11885af		
1700-1800	Tanzania	5985af	9684af	11765af	
1700-1800	USA, CSMonitor Boston	11580as	13625as	17510na	21640af
1700-1800 sa	USA, CSMonitor Boston	13710na	17555am		
1700-1800	USA, KTNB Salt Lake City	15590am			
1700-1800	USA, VOA Washington	6110as	7125as	9645as	15395as
1700-1800	USA, WHRI Noblesville	13760am	15105am		
1700-1800	USA, WJCR Upton, Kentucky		7490na		
1700-1800 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
1700-1800 vl, irr	USA, WRNO New Orleans	15420na			
1700-1800	USA, WWCR Nashville	15690na	17535na		
1700-1800	USA, WYFR Okeechobee, FL		21500va		
1700-1800	Zambia, Radio Zambia Int'l	9505af	11880af	17895af	
1706-1800	Ghana, Radio 2, Accra	3366do			
1715-1730	Cameroon CRTV Beau	3970do			
1715-1730	South Korea World News	7550as	15575as		
1715-1730	Vatican Radio	6245eu	7250eu		
1715-1745	United Kingdom, BBC London	9560ca	21660ca		
1728-1800	Sierra Leone, SLBS	3316do			
1730-1745 a	Cameroon CRTV Douala	4795do			

1730-1745	Cyprus, Radio Bayrak	6150va			
1730-1800	Bulgaria, Radio Sofia	9700af	11720af	11765af	15330af
		17780af	17825af		
1730-1800 a	Latvia, Radio Riga	5935eu			
1730-1800	Netherlands	6020af	9605af	21515af	21590af
1730-1800	Romania, R. Romania Int'l	15340af	15365af	17745af	17805af
1730-1800	Swaziland, TWR Swaziland	3200af			
1730-1800	United Kingdom, BBC London	3255af	3915as	5975as	6005af
	6180eu	6190af	6195eu	9410eu	9630af
	11775na	12095eu	15070eu	15260na	15310as
	15420af	17640va	17695eu	17860af	17880af
1730-1800	USA, VOA Washington	6040eu	9575af	9700eu	9760eu
	11920af	15205eu	15205me	15410af	15495af
	17650af	17800af	21625af		15580af
1730-1800	Vatican Radio	11625af	15090af	17730af	
1740-1800	Cameroon CRTV Yaounde	4850do			
1745-1800 mtwhfa	Cameroon CRTV Douala	4795do			
1745-1800	India, All India Radio	7412as	9950as	11620as	11860as
		11935as	15080as		
1745-1800 tent	Madagascar, RTV Madagascar	3232do	3286do	5005do	

1800 UTC

[2:00 PM EDT/11:00 AM PDT]

1800-1810	Malawi B'casting Corp.	3381do			
1800-1825	Belgium, BRT Brussels	9905eu	17750af		
1800-1825	Netherlands	6020af	9605af	21515af	21590af
1800-1830	Canada, RCI Montreal	13670af	15260af	17820af	
1800-1830	Congo, RTV Congolaise	3265af	4765af		
1800-1830	Czechoslovakia	5930eu	6055eu	7345eu	9605eu
1800-1830	Egypt, Radio Cairo	15255af			
1800-1830	United Kingdom, BBC London	3255af	3955eu	5975as	6180eu
	6190af	6195eu	7160me	7325af	9410eu
	9740me	11750as	12095eu	15070eu	15310as
	17640eu	17880af	21660af		15400af
1800-1830	Vietnam, Voice of	9840eu	12020eu	15010eu	
1800-1840 w	Cameroon CRTV Bertoua	4750do			
1800-1845 mtwhfa	Cameroon CRTV Douala	4795do			
1800-1845	Swaziland, TWR Swaziland	3200af	9600af		
1800-1850 smtwhf	New Zealand, RNZI	9675pa			
1800-1900	Australia	5995pa	6060pa	6080pa	9505pa
		9580pa	9860pa	11910pa	12000pa
1800-1900	Bahrain Broadcasting Svc	6010me			
1800-1900	Brazil, Radiobras	15265eu			
1800-1900	Bulgaria, Radio Sofia	9700af	11720af	11765af	15330af
		17780af	17825af		
1800-1900	Cameroon CRTV Yaounde	4850do			
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Cook Islands	11760pa			
1800-1900	Costa Rica, RFPI	13630am	15030am	21465am	
1800-1900 sa	Eq. Guinea, R. East Africa	7190af			
1800-1900	Ethiopia, Voice of	9662af			
1800-1900	Ghana, Radio 1, Accra	4915do			
1800-1900	Ghana, Radio 2, Accra	7295do			
1800-1900	Guam, KSDA Guam	13720as			
1800-1900	India, All India Radio	7412as	9950as	11620as	11860as
		11935as	15080as		
1800-1900 varies	Italy, IRRS Milan, Italy	7125eu			
1800-1900	Ivory Coast, Abidjan	11920af			
1800-1900 mtwhf	Kenya, Voice of	4935do			
1800-1900	Korea, Seoul	15575eu			
1800-1900	Kuwait, Radio Kuwait	13620na			
1800-1900	Luxembourg, RTL	15350va			
1800-1900 irreg	Mozambique	3265af	4855af	9618af	
1800-1900	Nigeria	3326do	4990do		
1800-1900	Russia, Radio Moscow	9795va	9855va	9860va	9875va
	9895va	11630va	11685va	11745va	11840am
	12030na	12050na	15375va	15425na	15515na
	17565va	17655va	17695na	17710na	15580va

1800 UTC cont'd.

1800-1900	Saudi Arabia BC Svc	9705eu	9720eu		
1800-1900	Sierra Leone, SLBS	3316do			
1800-1900	Tanzania	5985af	9684af	11765af	
1800-1900	USA, CSMonitor Boston	9425pa	17510na	17725eu	21545af
1800-1900 sa	USA, CSMonitor Boston	17555am			
1800-1900	USA, KTBN Salt Lake City	15590			
1800-1900	USA, VOA Washington	6040eu	9700eu	9760me	15205me
	6040eu	9575af	9700eu	9760me	11920af
	15410af	15445af	15580af	17650af	17800af
					21625af
1800-1900	USA, WHRI Noblesville	13760na	17835sa		
1800-1900	USA, WINB Red Lion, Penn.	15295eu			
1800-1900	USA, WJCR Upton, Kentucky		7490na		
1800-1900	USA, WMLK Bethel, Penna.	9465eu			
1800-1900	USA, WWCR Nashville	15690na	17535na		
1800-1900	USA, WYFR Okeechobee, FL		21500va		
1800-1900	Zambia, Radio Zambia Int'l	9505af	11880af	17895af	
1815-1830	Lebanon, Radio Voice of	6550me			
1815-1900	Bangladesh	12030as	15255as		
1830-1900	Afghanistan, Kabul	9635am			
1830-1900	Austria, ORF Vienna	5945eu	6155eu	12010me	13730af
1830-1900 as	Canada, RCI Montreal	13670me	15260me	17820me	
1830-1900	Finland, YLE	6120eu	9730af	11755af	15440eu
1830-1900	Iran, Islamic Republic	9022af	15260eu		
1830-1900	Netherlands	6020af	9605af	21515af	21590af
1830-1900	Sri Lanka B'casting Corp.	9720eu	15120eu		
1830-1900	United Kingdom, BBC London	3255af	3955eu	6005af	6180eu
	6190af	6195eu	7325eu	9410eu	9600af
	11955va	12095eu	15070eu	15400af	17880af
					21660af
1830-1900	Yugoslavia, Radio Federal	6100eu	15140af		
1833-1900	Ivory Coast, Abidjan	11920af			
1840-1850 mtwhfa	Greece, Voice of	15630af	17525af		
1840-1850 mtwhfa	Venezuela, Radio Nacional	9540om			
1845-1900	Ghana B'casting Corp.	6130af			
1845-1900	Guinea, RTV Conarky	4900af	7125af		
1845-1900 s	Mali, RTV Mali	4783do	4835do	5995do	7285do
1845-1900	Swaziland, TWR Swaziland	3200af			
1850-1900 smtwhf	New Zealand, RNZI	15120pa			

1900 UTC

[3:00 PM EDT/12:00 PM PDT]

1900-1915	Tanzania	5985af	9684af	11765af	
1900-1920	Brazil, Radiobras	15265eu			
1900-1925	Netherlands	6020af	9605af	21515af	21590af
1900-1930 mtwhf	Canada, RCI Montreal	13670me	15260me	17820me	
1900-1930 as	Canada, RCI Montreal	5995eu	7235eu	13650eu	15325eu
		17875eu	21675eu		
1900-1930	Iran, Islamic Republic	9022af	15260eu		
1900-1930	Israel, Kol Israel	11587eu	11605sa	11675eu	15640eu
		17575eu	17630af		
1900-1930	Ivory Coast, Abidjan	11920af			
1900-1930	Japan NHK	9640am	11850af	11865va	
1900-1930 s	Lebanon, King of Hope	11530me			
1900-1930 as	Norway	17860va	21705va		
1900-1930	United Kingdom, BBC London	3255af	3955eu	6005af	6180eu
	6190af	6195eu	7160me	7325eu	9410eu
	9630af	11750pa	12095eu	15070eu	15400af
	21660af				17880af
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu	
1900-1945	Cameroon CRTV Yaounde	4850do			
1900-1950	Germany, Deutsche Welle	11785af	11810af	13780af	13790af
		15350af	15390af	17810af	
1900-2000	Argentina, RAE Buenos Aires	15345eu			
1900-2000	Australia	5995pa	6060pa	6080pa	7240pa
		9505pa	9580pa	9860pa	11720as
		11910pa	12000pa		
1900-2000	Bahrain Broadcasting Svc	6010me			
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZU Vancouver	6160do			

1900-2000 mtwhf	Canada, RCI for UN Forces	5995eu	7235eu	13650eu	15325eu
		17875eu	21675eu		
1900-2000	China, Radio Beijing	9440af	11515af		
1900-2000	Cook Islands	11760pa			
1900-2000	Costa Rica, RFPI	13630am	15030am	21465am	
1900-2000	Ecuador, HCJB Quito	15270eu	17790eu	21455eu	
1900-2000 sa	Eq. Guinea, R. East Africa	7190af			
1900-2000	Ghana B'casting Corp.	6130af			
1900-2000	Ghana, Radio 1, Accra	4915do			
1900-2000	Ghana, Radio 2, Accra	7295do			
1900-2000	India, All India Radio	7412va	9950va	11620va	11860va
		11935va	15080va		
1900-2000 mtwhf	Kenya, Voice of	4935do			
1900-2000	Kuwait, Radio Kuwait	13620na			
1900-2000	Luxembourg, RTL	15350va			
1900-2000 s	Morocco, Rabat	11920as			
1900-2000 smtwhf	New Zealand, RNZI	15120pa			
1900-2000	Nigeria	3326do	4990do		
1900-2000	Nigeria, Voice of	7255af			
1900-2000	Romania, R. Romania Int'l	7145eu	9690eu	9750eu	11940eu
1900-2000	Russia, R. Galaxy, Moscow	9880do			
1900-2000	Russia, Radio Moscow	11840am	11900va	12050va	12055va
	12060va	12070na	13645na	13665va	15180na
	15405na	15415na	15425na	15500na	15580na
	17605na	17655va	17695na	17795va	17565va
1900-2000	Saudi Arabia BC Svc	9705eu	9720eu		
1900-2000	Sierra Leone, SLBS	3316do			
1900-2000	Spanish National Radio	6130as	9675af	9685eu	9875eu
1900-2000	Sri Lanka B'casting Corp.	9720eu	15120eu		
1900-2000	Swaziland, TWR Swaziland	3200af	3240af		
1900-2000	USA, CSMonitor Boston	9425pa	17510na	17725eu	21545af
1900-2000 sa	USA, CSMonitor Boston	17555am			
1900-2000	USA, KTBN Salt Lake City	15590am			
1900-2000	USA, KVOH Los Angeles	17775sa			
1900-2000	USA, VOA Washington	6040eu	9525as	9575af	9700eu
	9760eu	11710eu	11870as	11920af	15180au
	15410af	15445af	15495af	15580af	17800af
1900-2000	USA, WHRI Noblesville	13760na	17835na		
1900-2000	USA, WINB Red Lion, Penn.	15295eu			
1900-2000	USA, WJCR Upton, Kentucky		7490na		
1900-2000	USA, WMLK Bethel, Penna.	9465eu			
1900-2000	USA, WWCR Nashville	15690am	17535na		
1900-2000	USA, WYFR Okeechobee	15355eu	21615af		
1900-2000	Zambia, Radio Zambia Int'l	9505af	11880af	17895af	
1910-1915	Botswana, Gaborone	3356af			
1920-1930	Cameroon CRTV Beau	3970do			
1930-1940 irr	Burkina Faso	4815af	7230af		
1930-2000	Canada, RCI Montreal	6010eu	7230eu	13650eu	15325eu
		17875eu	21675eu		
1930-2000	Czechoslovakia	6055eu	7345eu		
1930-2000 fa	Kazakhstan, R. Alma Ata	3955do	5035do	5260do	5960eu
	5970eu	7115eu	9505eu	9690eu	11825eu
	15250eu	15270eu	15285eu	15315eu	15215eu
	17605eu	17730eu	17765eu	21490eu	15360eu
1930-2000	Netherlands	17605af	21590af		
1930-2000	Polish Radio Warsaw	6095eu	6135eu	7145eu	7270eu
		9525eu			
1930-2000	Saipan, KFBS Saipan	9460af			
1930-2000	United Kingdom, BBC London	3255af	3955eu	6005af	6180eu
	6190af	6195eu	7160me	7325eu	9410eu
	9630af	11750pa	12095eu	15070eu	15400af
	21660af				17880af
1935-1945	Togo, RTV Togolaise	5047af			
1935-1955	Italy, RAI, Rome	7275eu	9710eu	11800eu	
1940-2000 smwha	Mongolia, Ulaanbaatar	11850eu	12015eu		
1945-2000	Bulgaria, Radio Sofia	11765as	17780as	17825as	
1945-2000	South Korea World News	6135as			
1950-2000	Sudan Nat'l B'casting Cor	9540do	9550do	11635do	
1950-2000	Vatican Radio	5885eu	7250eu		

2000 UTC

[4:00 PM EDT/1:00 PM PDT]

2000-2010 mtwhf	Kenya, Voice of	4935do			
2000-2010 w	Malawi B'casting Corp.	3381do			
2000-2010 smwha	Mongolia, Ulaanbaatar	11850eu	12015eu		
2000-2015 mtwhfa	Greece, Voice of	7450eu	9395eu		
2000-2025	Polish Radio Warsaw	6095eu	6135eu	7145eu	7270eu
		9525eu			
2000-2030	Bulgaria, Radio Sofia	11765as	17780as	17825as	
2000-2030	Netherlands	17605af	21590af		
2000-2030	Nigeria, Voice of	7255af			
2000-2030 mtwhf	Portugal	11740eu			
2000-2030	Swiss Radio Int'l	9885eu	9885me	12035me	13635me
		15505me			
2000-2030	United Kingdom, BBC London	3255af	3955eu	5975eu	6005af
	6180eu	6190af	6195eu	7180pa	7325eu
	9410eu	9600as	9630af	11750pa	12095eu
	15260sa	15340pa	15400af	17880af	21660af
2000-2030	Vatican Radio	9645af	11625af	15090af	
2000-2050	North Korea	6576eu	9345eu	9640af	9977af
2000-2100	Australia	5995pa	6060pa	6080pa	7240pa
		9580pa	11720as	11910pa	12000pa
2000-2100	Bahrain Broadcasting Svc	6010me			
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, Radio Beijing	4130eu	9440af	9920eu	11500eu
		11715af	15170af		
2000-2100	Cook Islands	11760pa			
2000-2100	Costa Rica, RFPI	13630na	15030na	21465am	
2000-2100	Cuba, RHC Havana	15330eu	17705eu	17815me	
2000-2100 sa	Eq. Guinea, R. East Africa	7190af			
2000-2100	Ghana, Radio 1, Accra	4915do			
2000-2100	Ghana, Radio 2, Accra	7295do			
2000-2100	India, All India Radio	11935af	15080af		
2000-2100	Indonesia, Voice of	7125as	9675as	11752as	11785as
2000-2100	Kuwait, Radio Kuwait	13620na			
2000-2100	Lebanon, King of Hope	6280me			
2000-2100	Luxembourg, RTL	15350va			
2000-2100 smtwhf	New Zealand, RNZI	15120pa			
2000-2100	Nigeria	3326do	4990do		
2000-2100	Russia, R Galaxy, Moscow	9880do			
2000-2100	Russia, Radio Moscow	11675na	11840na	12050va	13665na
		15375na	15405na	15425na	15500va
		15560na	15580na	17695na	17795va
2000-2100 tes	Saipan, KFBS Saipan	9475af			
2000-2100	Saudi Arabia BC Svc	9705eu	9720eu		
2000-2100 mtwhf	Senegal (multilingual)	7210do			
2000-2100	Sierra Leone, SLBS	3316do			
2000-2100	Swaziland, TWR Swaziland	3200af	3240af		
2000-2100	USA, CSMonitor Boston	9455as	13625pa	15665eu	17510am
		17555sa			
2000-2100	USA, KTNB Salt Lake City	15590am			
2000-2100	USA, KVOH Los Angeles	17775sa			
2000-2100	USA, VOA Washington	6040eu	9700eu	9760eu	11710eu
		13710af	15160eu	15205eu	15410af
		15580af	17650af	17800af	17895af
				21485af	21625af
2000-2100	USA, WHRI Noblesville	13760af	17835va		
2000-2100	USA, WJCR Upton, Kentucky		7490na		
2000-2100	USA, WMLK Bethel, Penna.	9465eu			
2000-2100	USA, WRNO New Orleans	15420na			
2000-2100	USA, WWCR Nashville	15690na	17535na		
2000-2100	USA, WYFR Okeechobee, FL	17355eu	15566eu	15585eu	17750af
		21525eu			
2000-2100 s	Zambia, Radio Zambia Int'l	9505af	11880af	17895af	
2005-2100	Syria, Radio Damascus	12085na	15095na		
2010-2100 sa	Kenya, Voice of	4935do			
2015-2030	Benin, Voice of the Rev.	4870af	5025af		
2025-2045	Italy, RAI, Rome	7235me	9575me	11800me	
2030-2035	Latvia, 1st Programme	5935do			
2030-2100	Egypt, Radio Cairo	15375af			
2030-2100 mh	Estonia, Tallinn	5925eu	9560eu		
2030-2100 varies	Georgian Radio, Tbilisi	11760eu			
2030-2100	Korea, Seoul	6480eu	7550af	15575eu	

2030-2100	Sweden	6065va	9655va	17730as		
2030-2100	United Kingdom, BBC London	3255af	3955eu	5975ca	6005af	
	6040	6180eu	6190af	6195eu	7180pa	7325eu
	9410eu	11750pa	12095eu	15070eu	15260sa	15340pa
	15400af	15495	15580as			
2030-2100	Vietnam, Voice of	9840eu	12020eu	15010eu		
2045-2100	South Korea World News	5975as				

2100 UTC

[5:00 PM EDT/2:00 PM PDT]

2100-2105	Syria, Radio Damascus	12085na	15095na		
2100-2106	Bahrain Broadcasting Svc	6010me			
2100-2110	Malawi B'casting Corp.	3381do			
2100-2110	Vatican Radio	5885eu	7250eu		
2100-2115	Swaziland, TWR Swaziland	3240af			
2100-2125	Belgium, BRT Brussels	5910eu	9905eu		
2100-2129	Canada, RCI Montreal	5995eu	7235eu	13650eu	
2100-2130	China, Radio Beijing	3985eu	11715af	15170af	
2100-2130	Czechoslovakia	5930eu	6055eu	7345eu	9605eu
2100-2130	Korea, Seoul	6480eu	7550af	15575eu	
2100-2130	Lebanon, King of Hope	6280me			
2100-2130 smtwhf	New Zealand, RNZI	15120pa			
2100-2130 as	Norway	17845na	21705va		
2100-2130 mtwhf	Portugal	15250af			
2100-2130	Sweden	6065va	9655va	17730as	
2100-2130	United Kingdom, BBC London	3255af	3955eu	5975ca	6005af
	6180eu	6195as	7325eu	9410eu	9590na
	12095eu	15070na	15260sa	15340pa	15400af
2100-2145	Yugoslavia, Radio Federal	6100eu	11735na	11870na	
2100-2150	Germany, Deutsche Welle	9670eu	9765eu	11785eu	13780as
		15350as	15360as		
2100-2200	Angola, R. Nacional	3355af	9535af		
2100-2200	Australia	5995pa	6060pa	6080pa	11720pa
		11880pa	13705pa	15365as	
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2200	Canada, RCI Montreal	15325af	17875af		
2100-2200	China, Radio Beijing	4130eu	8260eu	9920eu	11500eu
		15170eu			
2100-2200	Cook Islands	11760pa			
2100-2200	Costa Rica, RFPI	13630na	15030na	21465am	
2100-2200	Egypt, Radio Cairo	15375af			
2100-2200 sa	Eq. Guinea, R. East Africa	7190af			
2100-2200	Ghana, Radio 1, Accra	4915do			
2100-2200	Ghana, Radio 2, Accra	7295do			
2100-2200	Hungary, Radio Budapest	6110eu	9835eu	11910eu	
2100-2200	India, All India Radio	7412eu	9910eu	9950eu	11620eu
		11715eu	15265eu		
2100-2200	Japan NHK	11815me	11840eu	15430eu	17810as
		17890as			
2100-2200	Luxembourg, RTL	15350va			
2100-2200	Nigeria	3326do	4990do		
2100-2200	Romania, R. Romania Int'l	5955eu	7145eu	9690eu	9750eu
		11940eu			
2100-2200	Russia, R Galaxy, Moscow	9880do			
2100-2200	Russia, Radio Moscow	9685na	11780na	11840na	12040na
		12050na	12070na	13645na	13665na
		15405na	15425na	15485na	15500na
		17710va	17735va	21690va	
2100-2200	Sierra Leone, SLBS	3316do			
2100-2200	Spanish National Radio	6130eu			
2100-2200	Sri Lanka B'casting Corp.	15120as			
2100-2200	Ukraine, Kiev	5960eu	7250eu	7340eu	9600eu
		9635eu	9865eu	15135na	15570eu
2100-2200	USA, CSMonitor Boston	9455as	13625pa	15665eu	17510na
		17555sa			
2100-2200	USA, KTNB Salt Lake City	15590na			
2100-2200	USA, KVOH Los Angeles	17775sa			
2100-2200	USA, VOA Washington	6040eu	9700eu	9760me	11710me
		11870pa	11960me	15185pa	15205me

2100 UTC cont'd.

	15410af	15495af	15580af	17650af	17735pa	17800af
	17895me	19261af	21485af	21625af		
2100-2200	USA, WHRI Noblesville	13760am	17835na			
2100-2200	USA, WJCR Upton, Kentucky	7490na				
2100-2200	USA, WMLK Bethel, Penna.	9465eu				
2100-2200	USA, WRNO New Orleans	15420na				
2100-2200	USA, WWCR Nashville	15690am	17535am			
2100-2200	USA, WYFR Okeechobee, FL	7355eu	15566eu	17750af	21525eu	
2100-2200	Zambia, Radio Zambia Int'l	9505af	11880af	17895af		
2103-2110 tent	Croatian Radio, Zagreb	7240eu	9830eu	21480eu		
2110-2200	Syria, Radio Damascus	12085na	15095na			
2115-2130 s	Indonesia, R. Republik	6070do				
2115-2130 mtwhf	United Kingdom, BBC Carib.	15140ca	17715ca			
2115-2200	Egypt, Radio Cairo	9900eu				
2130-2145	Cameroon CRTV Beau	3970do				
2130-2155	Finland, YLE	6120af	11755as	15440eu		
2130-2200	Austria, ORF Vienna	5945eu	6155eu	9870af		
2130-2200	Canada, RCI Montreal	11880af	15150af	17820af		
2130-2200	Ecuador, HCJB Quito	15270eu	17790eu	21455eu	21480eu	
2130-2200	Israel, Kol Israel	11585eu	11605eu	15100na	15590eu	
		15640sa	17575eu			
2130-2200	Kazakhstan, R. Alma Ata	3955do	5035do	5260do	5960eu	
	5970eu	7115eu	9505eu	9690eu	11825eu	15215eu
	15250eu	15270eu	15285eu	15315eu	15360eu	15385eu
	17605eu	17730eu	17765eu	21490eu		
2130-2200 smtwhf	Lebanon, King of Hope	6280me				
2130-2200	Lithuania, Radio Vilnius	9675eu	9710eu			
2130-2200	New Zealand, RNZI	17770pa				
2130-2200	United Kingdom, BBC Falkl.	13660sa				
2130-2200	United Kingdom, BBC London	3255af	3955eu	5975ca	6005af	
	6180eu	6195as	7325eu	9410eu	9590na	11750pa
	12095eu	15070na	15260sa	15340pa	15400af	
2140-2150 mtwhf	Venezuela, Radio Nacional	9540am				
2145-2200	Bulgaria, Radio Sofia	11660na	11720am	15330eu		
2145-2200	Cameroon CRTV Yaounde	4850do				

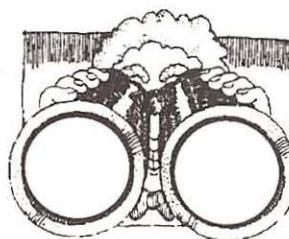
2200 UTC

[6:00 PM EDT/3:00 PM PDT]

2200-2210	Cameroon CRTV Bafoussam	4000do			
2200-2210	Syria, Radio Damascus	12085na	15095na		
2200-2215	Cameroon CRTV Yaounde	4850na			
2200-2215	Zambia, Radio Zambia Int'l	9505af	11880af	17895af	
2200-2218	Congo, RTV Congolaise	4765do	5985do		
2200-2225	Italy, RAI, Rome	9710as	11800as	15330as	
2200-2230	Albania, Radio Tirana	9760eu	11825eu		
2200-2230	Canada, RCI Montreal	5960na	9755na	11705as	11905na
		13670na			
2200-2230 2Russia	China, Radio Beijing	9740eu			
2200-2230	Czechoslovakia	5930eu	6055eu	7345eu	9605eu
2200-2230 a	Indonesia, Radio Republik	3385do	4805do		
2200-2230	Swiss Radio Int'l	9810sa	9885sa	12035sa	15570sa
2200-2230 s	USA, KGEI San Francisco	15280sa			
2200-2230	USA, VOA Washington	9530eu	11905me	11960me	15225me
		15445me	17885eu		
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2245	USA, WINB Red Lion, Penn.	15185eu	15195eu		
2200-2300	Australia	11720pa	11880pa	13705as	15240pa
		15320pa	15365as	17795pa	
		11660am	11720am	15330eu	
2200-2300	Bulgaria, Radio Sofia				
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2300	Cook Islands	11760pa			
2200-2300	Costa Rica, RFPI	13630ca	15030ca	21465am	
2200-2300	Cuba, RHC Havana	9620va	11930va		
2200-2300 sa	Eq. Guinea, R. East Africa	7190af			
2200-2300	Ghana, Radio 1, Accra	4915do			
2200-2300	Ghana, Radio 2, Accra	7295do			
2200-2300	India, All India Radio	7412eu	9910eu	9950eu	11620eu
		11715eu	15265eu		

2200-2300	Luxembourg, RTL	15350va			
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do			
2200-2300	New Zealand, RNZI	17770pa			
2200-2300	Nigeria	3326do	4990do		
2200-2300	Russia, Radio Moscow	11710na	12050na	15355na	15405na
		15410na	15425na	15485na	17655va
		17720va	17735na	21690na	
2200-2300	Sierra Leone, SLBS	3316do			
2200-2300	Singapore, SBC1	5010do	5052do	11940do	
2200-2300	Taiwan, V. of Free China,	17750eu	21720eu		
2200-2300	Turkey, Voice of	9445na			
2200-2300	UAE Radio Abu Dhabi	13605na	15305na	17855na	
2200-2300	United Kingdom, BBC London	5975na	6195as	7325am	9410eu
		9570pa	9590na	9915ca	11750sa
		11945as	11955as	12095na	15070na
		15260sa	15340as	15400af	17830as
2200-2300	USA, CSMonitor Boston	9465na	13625as	15405as	15665eu
		17555am			
2200-2300	USA, KLTN Salt Lake City	15590am			
2200-2300	USA, VOA Washington	7120as	9770as	11760as	15185au
		15290au	15305au	17735au	17820au
		13760na	17835sa		
2200-2300	USA, WHRI Noblesville	7490na			
2200-2300	USA, WJCR Upton, Kentucky				
2200-2300	USA, WRNO New Orleans	15420na			
2200-2300	USA, WWCR Nashville	12160na	15690na		
2200-2300	USA, WYFR Okeechobee, FL	17750eu	21525eu		
2230-2300 mtwhf	Congo, RTV Congolaise	4765do			
2230-2300	Sweden	6065eu			
2230-2300	USA, VOA Washington	9530eu	11905me	11960me	17885me
2240-2250 smtwhf	Greece, Voice of	11645au			
2245-2300	USA, WINB Red Lion, Penn.	15145eu			
2245-2300	Vatican Radio	9600au	11830au	15090au	

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FREQUENCIES

2300-0000	Australia	11720pa	11880pa	15240pa	15320pa	2300-0000	USA, WHRI Noblesville	9495na	13760sa
		15365as	17795pa			2300-0000	USA, WINB Red Lion, Penn.	15145eu	
2300-0000	Canada, CFCX Montreal	6005do				2300-0000	USA, WJCR Upton, Kentucky	7490na	
2300-0000	Canada, CFRX Toronto	6070do				2300-0000	USA, WRNO New Orleans	7355na	
2300-0000	Canada, CFVP Calgary	6030do				2300-0000	USA, WWCN Nashville	12160na	15690na
2300-0000	Canada, CHNX Halifax	6130do				2300-2305	Ghana, Radio 1, Accra	4915do	
2300-0000	Canada, CKZU Vancouver	6160do				2300-2305	Ghana, Radio 2, Accra	7295do	
2300-0000	Cook Islands	11760pa				2300-2315	Bulgaria, Radio Sofia	11660am	11720am 15330eu
2300-0000	Costa Rica, AWR	9725ca	11870ca			2300-2330	Canada, RCI Montreal	11940sa	15235na
2300-0000	Costa Rica, RFPI	13630na	15030na	21465am		2300-2330	Lithuania, Radio Vilnius	9675na	9710na 11780na 13645na
2300-0000	Guam, KSDA Guam	15610as						15580na	
2300-0000	India, All India Radio	9910as	11715as	11745as	15110as	2300-2330 as	Norway	11795am	
		15145as	17830as			2300-2330	United Kingdom, BBC London	5975na	6175na 6195as 7145as
2300-0000	Japan NHK	11735eu	11815am	15195as	17810pa			9410eu	9570pa 9590na 9915sa
		17840va						11750sa	11945as 11955as 12095na
2300-0000	Luxembourg, RTL	15350va						15070na	15260sa 15340pa 15400af
2300-0000 smtwha	Malaysia, RTM Radio 4	7295do				2300-2350	North Korea	11700am	13650am
2300-0000	New Zealand, RNZI	17770pa				2300-2350	Turkey, Voice of	9445na	
2300-0000	Russia, Radio Moscow	11710na	12050na	15355na	15405na	2300-2400	USA, KVOH Los Angeles	9725am	
		15410na	15425na	15485na	17570na	2315-0000 vi	Iraq, Radio Iraq Int'l	15150na	17740sa
		17685na	17720va	17735na	17890na	2330-0000 as	Canada, RCI Montreal	11940sa	15235sa
		21690na				2330-0000	Canada, RCI Montreal	9755am	11730am 13670am
2300-0000	Sierra Leone, SLBS	3316do				2330-0000 a	Colombia, R. Nacional	11822.5	17865am
2300-0000	Singapore, SBC1	5010do	5052do	11940do		2330-0000 m	Iran, Islamic Republic	9022am	15260am 15315am
2300-0000	South Africa, Radio Orion	4810af				2330-0000	Sri Lanka B' Casting Svc	15425am	
2300-0000	Thailand	4830as	9655as	11905as		2330-0000	United Kingdom, BBC London	5975na	6175na 6195as 7145as
2300-0000	UAE Radio Abu Dhabi	9605na	11965na	13605na				7325na	9570pa 9590na 9915sa
2300-0000	USA, CSMonitor Boston	9465na	13625as	15405af	15665eu			11750sa	11945as 11955as 12095na
		17555af						15070na	15260sa 17830as
2300-0000	USA, KTNB Salt Lake City	15590na				2330-0000	Vietnam, Voice of	9840as	12020as 15010as
2300-0000	USA, VOA Washington	7120as	9770as	11760au	15185au	2330-2355	Belgium, BRT Brussels	9930na	13655na
		15290au	15305as	17735as	17820as	2335-2345 smtwhf	Greece, Voice of	7450eu	9425sa 11645sa
2300-0000	USA, VOA Washington	9530me	11905me	11960eu	17885me				

SELECTED PROGRAMS

Sundays

- 2305 BBC: World Business Review. The previous week's news and upcoming events.
 2310 Voice of America: Newslines. News, correspondent reports, interviews, and opinion.
 2315 BBC: Music. Program details not available at press time.
 2330 Voice of America: VOA Morning. See S 0010.

Mondays

- 2305 BBC: World Business Report. The latest news from the markets worldwide.
 2310 Voice of America: Newslines. See S 2310.
 2315 BBC: Talks. Religious experiences recorded in poetry are the fare for "Hallowed Ground" (3rd, 10th).
 2325 BBC: Talks. "The Man Behind The Word" looks at historical figures like Boycott, Guillotin, and Mesmer (3rd, 10th).
 2330 BBC: Multitrack 1: Top 20. Tim Smith presents the smash singles on the UK pop music charts.
 2330 Voice of America: VOA Morning. See S 0010.

Tuesdays

- 2305 BBC: World Business Report. See M 2305.
 2310 Voice of America: Newslines. See S 2310.
 2315 BBC: From The Proms. See S 1515.
 2330 Voice of America: VOA Morning. See S 0010.

Wednesdays

- 2305 BBC: World Business Report. See M 2305.
 2310 Voice of America: Newslines. See S 2310.



*John Carson of Norman, OK,
sends us this QSL from Israel
Broadcasting Authority.*

- 2315 BBC: From Our Own Correspondent. See S 0330.
 2330 BBC: Multitrack 2. Graham Bannerman presents new pop records, interviews, news, and contests.
 2330 Voice of America: VOA Morning. See S 0010.

Thursdays

- 2305 BBC: World Business Report. See M 2305.
 2310 Voice of America: Newslines. See S 2310.
 2315 BBC: Music Review. News and views from the world of classical music.
 2330 Voice of America: VOA Morning. See S 0010.

Fridays

- 2305 BBC: World Business Report. See M 2305.
 2310 Voice of America: VOA Morning. See S 0010.
 2315 BBC: Worldbrief. A roundup of the week's news headlines and developments.
 2330 BBC: Multitrack 3. News and releases from the British alternative music scene.

Saturdays

- 2305 BBC: Words Of Faith. See S 0309.
 2310 BBC: Book Choice. See H 0140.
 2310 Voice of America: VOA Morning. See S 0010.
 2315 BBC: A Jolly Good Show. See T 1515.

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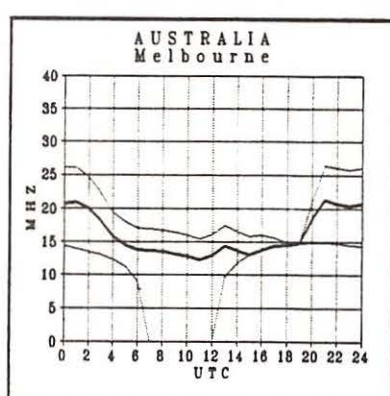
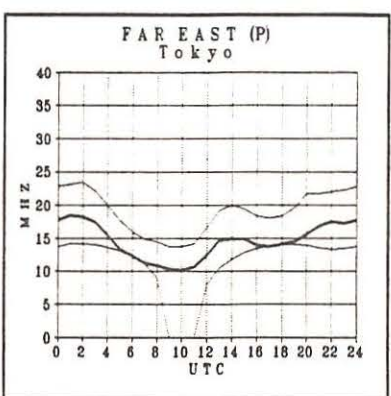
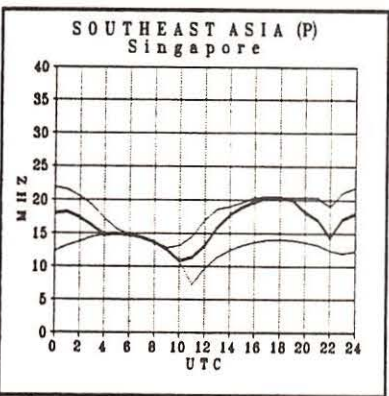
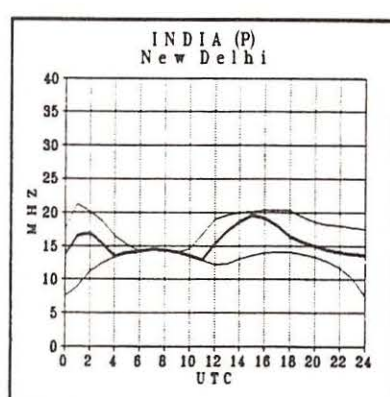
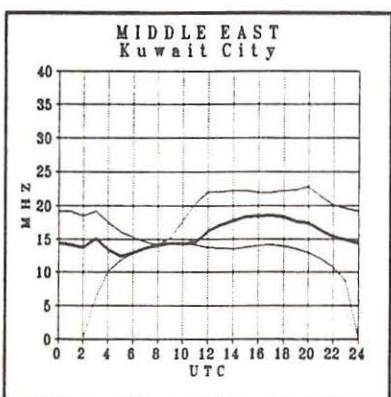
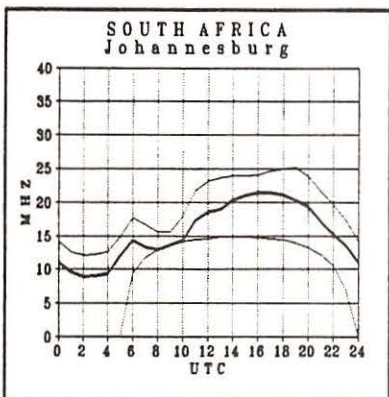
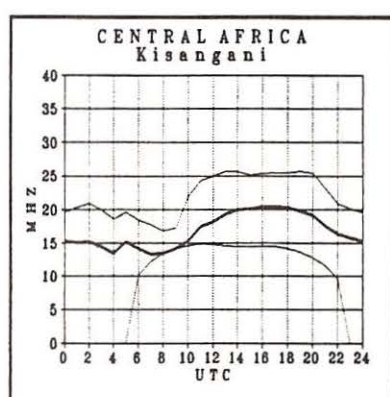
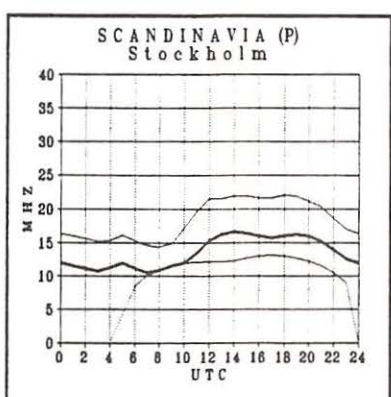
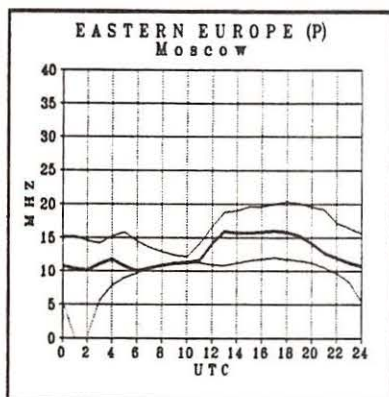
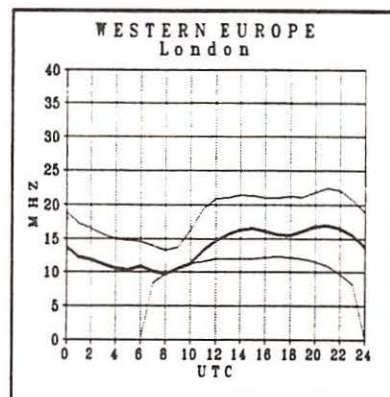
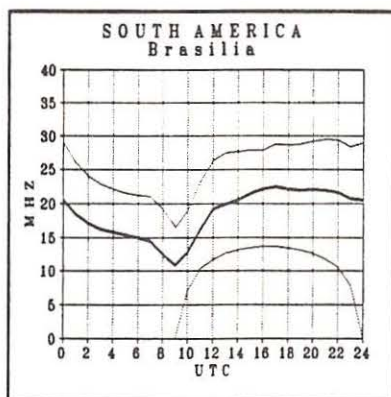
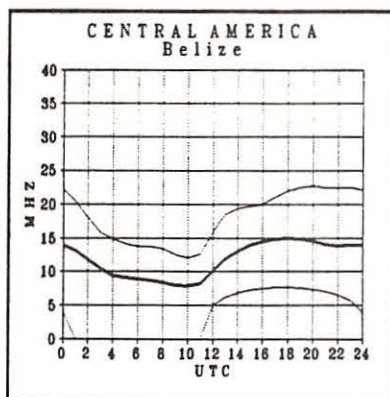
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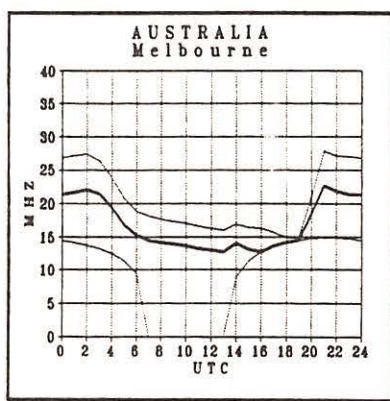
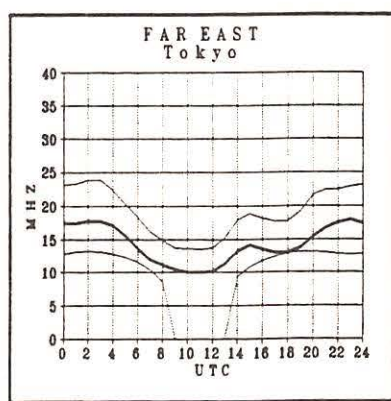
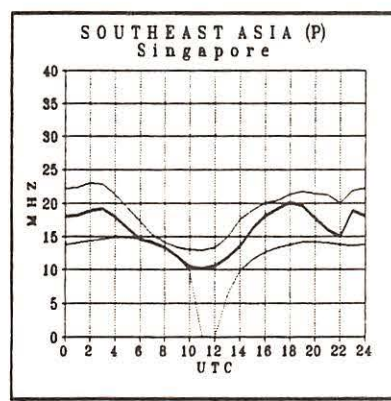
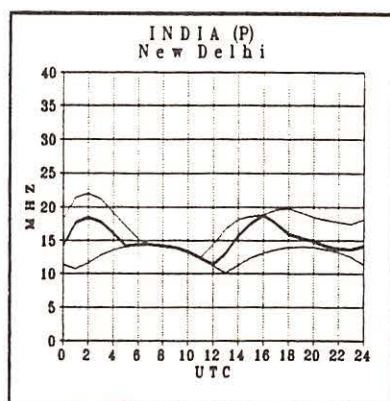
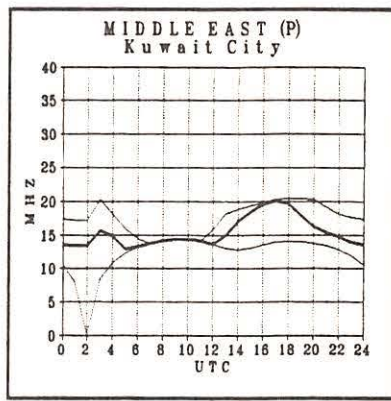
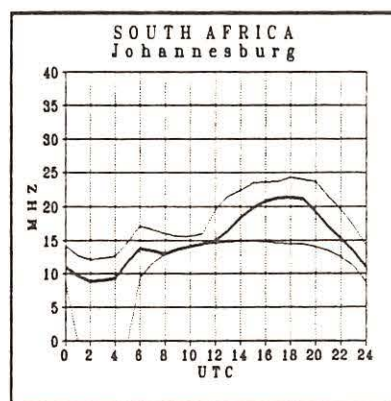
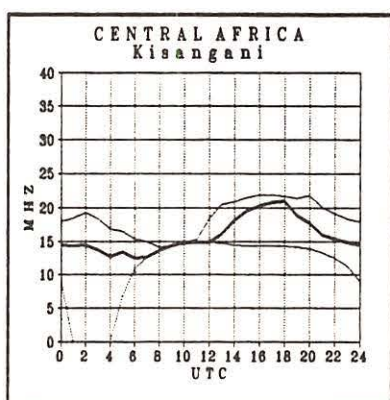
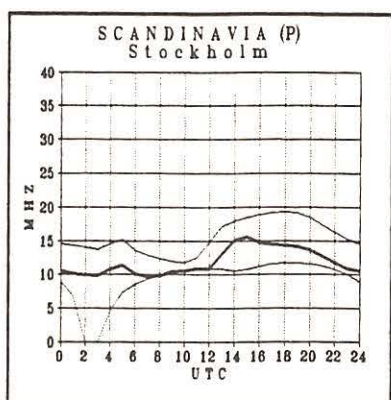
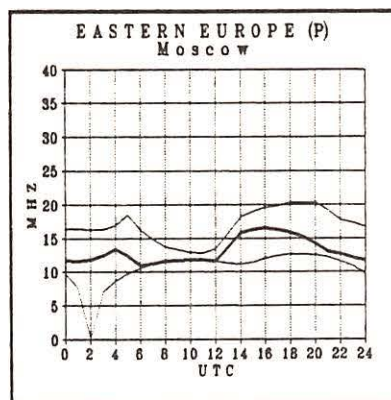
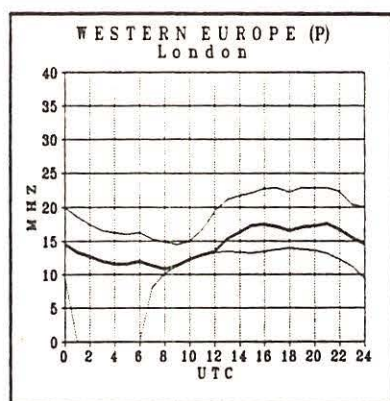
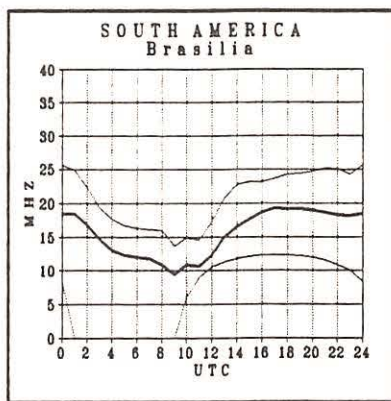
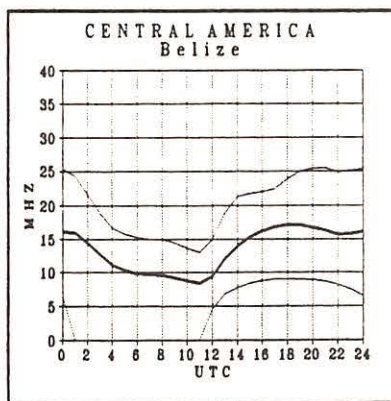
Propagation conditions: Eastern United States

How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.



Propagation Conditions: Western United States

Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances.



what's new?

Larry Miller



Realistic New PRO-43

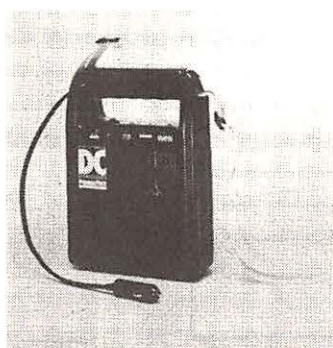
It's one of the nicest, handiest handhelds to come out in years: Realistic's new PRO-43 handheld. 200 memory channels, good frequency coverage (30-54, 118-174, 220-512, 806-823.9375, 851-868.9375 and 896-999.9875 MHz) and neat size (fits in your outstretched hand minus antenna) make this a real winner.

Bob Grove puts the PRO-43 scanner through its paces this month. The results of his inquisition can be found on page 94.

Power: Everybody Wants It

One of the advantages of owning a radio is its ability to keep you informed in time of emergency. But if the power goes out, your radio is left in the dark. If only you had a back-up power supply.

Innova Electronics Corporation has introduced a 12 volt recharge-



able DC power pack that is perfect for the person who needs a reliable, portable, power supply. All you need to do is check your radio to see if it's got a 12 volt jack. If it does, you're in business.

The Innova 12 volt DC Power Pack has a 6.5 amp-hour, rechargeable battery that can power a radio for up to 36 hours. The entire unit measures 7" x 10" x 3" and weighs just under 7 pounds so it's easy to take along. The unit can be recharged through the cigarette lighter socket of any car or boat (1 to 3 hours recharging time), or through an optional AC/DC adapter (8 to 10 hours recharging time) or solar panel (also optional; 8 to 10 hours recharging time).

The Innova 12 volt power pack is "must have" for anyone who wants to keep abreast of the latest happenings via radio and who doesn't want to get cut off when the power is. The Innova Power Pack will also power a wide variety of consumer products as well, ranging from camcorders to worklights.

Look for the Innova 12 volt power pack at a variety of nationwide dealers including Sears, Target and Ham Radio Outlet for a price of around \$65. For more information, contact Innova Electronics, 17291-MT Mount Herrmann St., Fountain Valley, CA 92708; 800-544-4150.

Loud and Clear

The speakers that come with most scanners are a little on the small size. They're great for most listening circumstances but if things get even a little noisy — like in a car — they can be overwhelmed and you can miss important information.

Naval Electronics is now offering its new HTS-2 amplified speaker. Plug the HTS-2 into your scanner's earphone or external speaker jack. Its powerful 12 dB audio amplifier and 3.5 inch oval speaker give an almost "hi-fi" sound that's controlled by your radio's volume control.

But this is no ordinary amplified speaker. The HTS-2 can be powered from internal NiCad batteries (with charger) or any 12 volt DC power source, like a wall adapter or cigarette lighter. A special "battery saver" circuit shuts off the audio amplifier automatically if there is no audio for more than 10 seconds, but turns it on the instant a frequency becomes active.

The HTS-2 also has a built-in "tape trigger" circuit that will turn on your cassette tape recorder automatically when an audio signal is detected and switch it off again when the audio disappears. It's perfect for keeping track of what's happening in your town when you're asleep or at work.

The HTS-2 Amplified Speaker comes with two sets of cables and is available for \$29.95. To order yours write Naval Electronics, Inc., 5417-MT Jet View Circle, Tampa, Florida 33634 or call 813-885-6091.

I Wanna Be a Ham

If you've ever read the credits at the end of the "Communica-

The Ham Education BOOKSTORE

tions" column, you've undoubtedly seen the *W5YI Report* in the list. The editor of the publication is Fred Maia, ham call sign W5YI.

Fred Maia is both a high-powered ambassador and a cheerleader on behalf of ham radio. He is a tireless worker whose accomplishments simply dwarf those of most others in the field. In a world of 115 volt people, Fred Maia is 360 volts AC.

Convinced that he has not yet reached every possible potential amateur radio operator, Maia runs The Ham Education Bookstore. There are many offerings, among them the "Ham Operator Software Education Package," an interactive computer-aided course that covers both Code and Theory (all 2000+ questions for every license class from Novice through Extra).

"HOSEP" contains eight 3-1/2 and 5-1/4 IBM compatible disks, 200 pages of documentation and a 1992 (updated) Part 97 Rule book. The price is \$39.95 plus \$3.00 priority mail second day delivery.

You can study for the new Codeless Technician ham license right at your IBM compatible PC with W5YI's "No Code Technician Software Package." It reviews all questions (answer explanations provided), prints out sample tests and even has sound effects.

"NCTSP" contains both size IBM disks and the 208 page *Ham Radio No-Code Handbook*. W5YI asks \$29.95 plus \$3.00 shipping.

There are dozens of other ham aides for sale on this one-page flyer. Send Fred a self-addressed stamped envelope and ask for the Ham Education Bookstore list. The address is P.O. Box 565101-MT, Dallas, Texas 75356.

Grab-N-Go Antenna

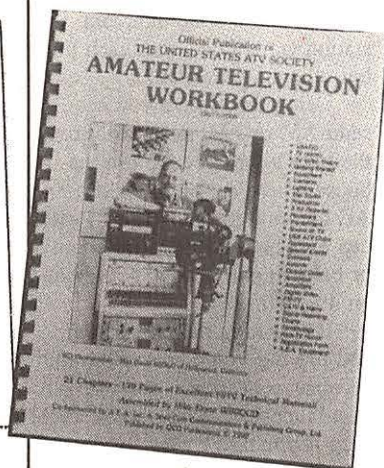
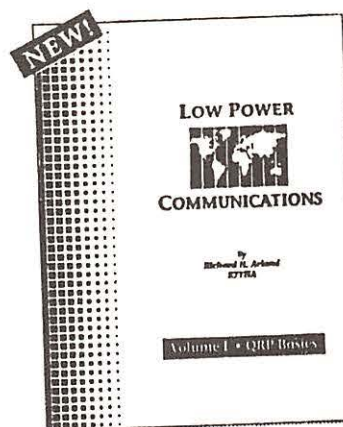
AntennasWest has put together a "Grab-N-Go" antenna pack designed to be used at picnics, camping, vacations and field operations. Included in the package is a kink-proof, weather sealed G5RV antenna, 70 feet of coax feedline and the complete QRV Quick-Launch installation system, all in a single, easy-to-grab and easy to use package.

The "Grab-N-Go" with 51 foot dipole is \$89.95 plus \$9.00 shipping; the 102 foot dipole is \$99.95 plus \$11 shipping. To order call 1-800-926-7373 or write AntennasWest at 1500 N. 150 West, Provo, Utah 84605. Be sure to say you saw it in *Monitoring Times*.

QRP evangelist, Arland has mounted the pulpit at Tiare Publications in his book, *Low Power Communications*.

To those who immediately view the title as yet another excuse to wrap a package of tired old homebrew projects between two sheets of construction paper, please breathe a sigh of relief. Arland's book is a conversational, easy-to-read and (gasp!) interesting book on low-power communications. Even non-hams will enjoy the QRP "Band-by-Band Tour" with its tips for DXing.

QRP is an area of operation and monitoring that is new to many. With Arland's first volume, the evangelist is sure to bring more low power converts to the faith. *Low Power Communications Volume 1* is \$14.95 plus \$2.00 shipping from Tiare Publications, P.O. Box 492-MT, Lake Geneva, Wisconsin 53147.



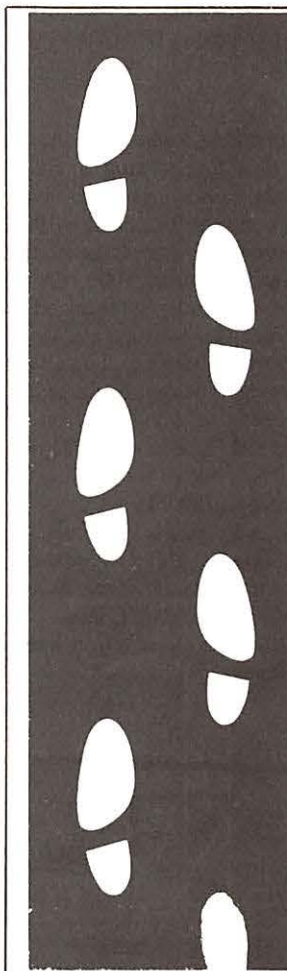
Low Power Communications

If you're a long-time *Monitoring Times* reader, you'll remember the name Rich Arland from the "Experimenter's Workshop" column B.C. (Before Cheek). Today, Arland writes a column on low powered communications or "QRP" for *WorldRadio*.

According to press material, Arland "is considered one of the top names in QRP circles." A

Amateur TV

The Amateur Television Workbook by Mike Stone, WB0QCD, newly retired editor of *Spec-Com Magazine*, is 21 chapters of information on Fast Scan TV (FSTV). Included in the publication is an overview of TV history, how to get started, equipment, cameras, lighting, production, transmitters, special events, antennas, awards and more — 170 pages in all. There are also enough pictures and wild ideas — one group launched a ham TV station in a 12 foot tall rocket! — to get just about



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anyone thinking about FSTV.

Apparently, some of the articles are reprints, but others appear to be original material. In any case, if you'd like to get the full run-down on one of amateur radio's fascinating offshoots, this is the book for you. To get your copy contact Universal Radio, 6830 Americana Pkwy, Dept. MT, Reynoldsburg, Ohio 43068 or call 1-800-431-3939. The price is \$14.95 plus \$1.00 book rate shipping.

Now You See It...

It's hard to believe that in a country that allows people to put pink plastic flamingos on their front lawns, many people cannot put an outside antenna on their roof. First it was apartment dwellers. Then it was people who lived in condos. Now even homeowners can be prohibited the right to monitor the airwaves

effectively. It's sick.

That's why we were so amazed to see the piece of incredible trickery and ingenuity that The Forbes Group has produced. Called the VT-SWL, it's an antenna that looks exactly like a roof vent. This 36 inch piece of pipe/antenna mounts on your existing vent pipe (from 1 inch to 2-1/2 inches, either plastic or metal) and immediately disappears into the scenery. Even the most nosey and paranoid neighbor won't notice this one.

The VT-SWL consists of antenna unit, an indoor coupler/gain control unit, 50 feet of connecting cable and receiver jumper cables (please specify receiver when ordering). An AC power adapter is also included.

The VT-SWL Ventenna is available for \$129.95 plus \$4.00 shipping and handling from The Forbes Group, P.O. Box 445-MT, Rocklin, California 95677. To order by phone call 1-800-551-5156.



High Gain 800 MHz Antenna

Electron Processing has announced two new antennas designed to cover the 800 to 950 MHz frequency range. The DANA-1 provides a reported 9 dB of gain and can be used for transmitting as well as receiving. The Super DANA provides 9 dB of gain and has a 15 dB amplifier. The Super Dana can be used for receiving only.

Both antennas utilize a multi-section co-linear antenna design and are encased in a rugged CPVC tube. At only 35" long, it is supplied completely assembled with mounting clamps for masts up to 1.5 inches in diameter.

The DANA-1 is priced at \$35.00 and the Super Dana is \$80.00. Shipping is \$5.00. To order or for more information call 616-228-7020 or write P.O. Box 68-MT, Cedar, Michigan 49621.

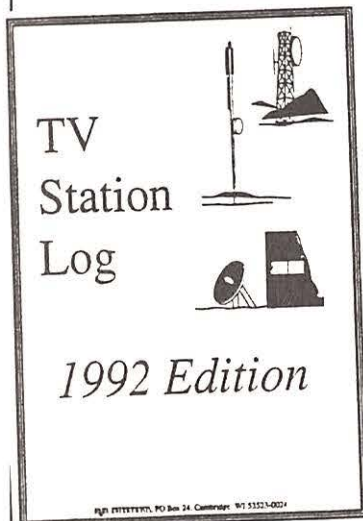
Bug Detector

Are you the subject of surveillance? Has your home or business been bugged? The TechSentry 1000 is a modern radio bug detector designed to be used by non-technical personnel. It is a tactical unit that can be moved easily from place to place and put into operation very quickly.

According to the manufacturer, Ross Engineering, anyone who can operate a radio receiver can operate the TechSentry 1000. No training program is necessary.

The TechSentry 1000 consists of a modern, fully synthesized radio receiver, microprocessor controller, software and ancillary equipment. The unit can detect bugs operating anywhere from 25 to 99.9999 MHz in AM, FM or SSB. The price of the TechSentry 1000 is \$12,750.00.

To order yours, call Ross Engineering at 703-318-8600 or write 44880 Falcon Place, Suite 198-MT, Sterling, Virginia 22170. Please allow 6 to 8 weeks for delivery.



TV Book

TV Station Log is an unbound, three hole-punched collection of information on TV stations in the U.S. and Canada. Information is arranged by channel and includes call letters, address, phone number, network and more. A cross-reference by call letters is also provided. Pages are unnumbered. Instead, each carries the book's name and a copyright notice.

To get your copy, send \$9.95 plus \$1.50 shipping and handling to Dajja Enterprises, P.O. Box 24, Cambridge, Wisconsin 53523. Tell 'em you read about it in *Monitoring Times*.



A Shortwave Radio in Every Room

Lloyd's Electronics has introduced a new wireless intercom/clock radio system that can put a shortwave receiver or scanner in every room of your house. Actually, the CR-400 is a combination AM-FM radio and intercom base. One intercom station is included with each unit but others are available.

Using the system you can send AM or FM broadcasts from the base to any location in the house where an intercom unit and AC outlet is located. The CR-400 can also be used as an intercom or baby monitor (does not operate on 49 MHz).

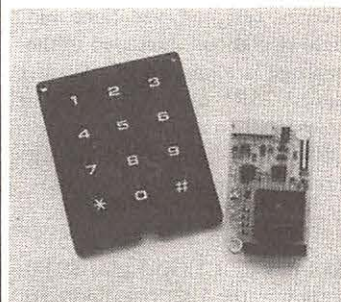
By pushing the talk button and placing your shortwave radio or scanner nearby, it can also act as a "repeater." This can be a real help if you don't want to disconnect your radio from an external antenna and move it when you're working in another part of the house.

The Lloyd's Wireless CR-400 Intercom is available nationwide at retail stores and consumer electronic outlets. The price is \$59.99.

Hidden Treasure

A review of the Fisher CZ-6 metal detector in the June issue listed the company's FAX number instead of voice phone, which is

209-826-3292. Call for a free catalog or write Fisher Research Laboratory, 200 W. Willmott Rd., Dept. MT, Los Banos, CA 93635.



Communications Specialists Morse Identifier

Repeaters and base stations, both amateur and commercial services, often utilize an automatic Morse code identifier to comply with FCC requirements. It's simpler — and more reliable — than trying to watch the clock.

The new ID-8 from Communications Specialists is field-programmable to permit up to eight changeable messages (200 characters total). Morse speed is adjustable from 1 to 99 words per minute with interval timing of 1-99 minutes and hold-off timing of 0-99 seconds.

Other adjustments include tone frequency (100-3000 Hz), "front porch" delay interval (0-9.9 seconds), courtesy tone selection and high or low activate/inhibit ID.

All programming is stored in a non-volatile EPROM, accessed by a keypad.

The ID-8 is \$89.95 from Communications Specialists, 426 West Taft Ave., Dept. MT, Orange, CA 92665-4296; 800-854-0547.

Reviews

Archer Amplified Antenna

A number of articles lately have mentioned the Archer Amplified VHF-UHF-FM Portable Antenna (catalog number 15-1607) sold through Radio Shack outlets as a good scanner accessory; we had to try one.

The unit is about the size of a pocket radio and has two telescoping 5"-24" whips extending from its sides; these can be swiveled to any position while the unit lies on its back. The interconnect cord is terminated with a 1/8" miniplug which requires a Motorola or BNC adaptor for use with scanners.

A bypass switch allows the unit to operate as a passive or active antenna system without having to be unplugged from the receiver's external antenna jack.

An AC wall adaptor is included, but the unit can also be operated in a portable configuration by supplying it with four AA alkaline cells for up to 50 hours of continuous duty.

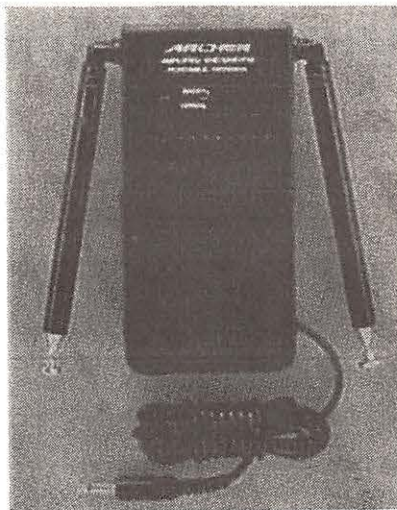
The specifications suggest that the amplified antenna can be used from 50-900 MHz with an average of 8-10 dB gain, but since the maximum noise figure is also 10 dB, we had serious questions about its effectiveness as a scanner antenna.

But let's be fair; after all, the accessory was designed for use with TV sets and FM radios, both of which have poor sensitivity when compared to communications equipment. Undoubtedly, the amplified antenna would provide improvement over the attached whips on these appliances.

We decided to test it on a Radio Shack hand-held scanner. On frequencies up to 174 MHz we couldn't tell any difference with the unit switched on or off, or any improvement over the Grove ANT-8 telescoping whip, but above 400 MHz the amplification provided noticeable improvement.

Since the amplified antenna can be adjusted to frequency and direction, it could conceivably be used in radio direction finding (RDF) applications, and certainly would be a worthwhile accessory as a portable antenna for motel rooms.

The Archer Amplified VHF-UHF-FM Portable Antenna is available for \$24.95 from Radio Shack outlets.



Single Channel VHF/UHF Filters

Scanner enthusiasts are not the only users of the VHF/UHF spectrum bothered by strong signal interference. Two-way licensees and cable broadcast services are often plagued by other nearby transmitters. In such cases, a tuned cavity filter may be the answer.

We recently sampled two such filters from Soda Machine Works of Cumberland, Rhode Island: CF-150 (108-174 MHz) and CF-450 (400-550 MHz). A CF-98B for 400-550 MHz and other custom filters are available as well.

Assembled from heavy, 1-1/2" copper tubing measuring 1-2 feet in length and tuned by a single E.F. Johnson air variable capacitor, the units sell for \$50 and are carry a lifetime guarantee against manufacturing defects. F connectors are provided for cable interconnection. Nominal impedance is 50-75 ohms.

Since these units are sharply tuned to pass one channel, their passband is way too narrow for wide-frequency-coverage scanners, but for single frequency applications, the units perform admirably, showing at least 30 dB attenuation of frequencies considerably off the tuned channel.

For further information on these units and related products, as well as the location of a dealer near you, contact Soda Machine Works, PO Box 182-MT, Cumberland, RI 02864.

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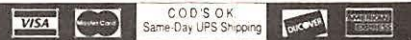
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Realistic PRO-43 Handheld Scanner

It is always a pleasure to review a new scanner that has something better to offer. The new PRO-43 handheld programmable from Realistic is such a product.

Smaller than most other handhelds on the market (2-3/4"W x 5-3/4"H x 1-5/8"D) and weighing approximately 9 ounces, the PRO-43 boasts continuous frequency coverage from 30-50, 118-174, 220-512 and 806-999.9875 MHz (less cellular). Included are several bands not found on most other hand-held scanners like 225-400 MHz military aircraft, the new 220-222 MHz land mobile service and 222-225 MHz amateur.

Scan rate is a respectable 25 channels per second and search rate whips along at 50; search steps are 5, 12.5 or 25 kHz, automatically preset by the frequency range selected. AM or FM mode is also automatically set by the frequency range, but may be manually changed when required.

The PRO-43 stores up to 200 memorized frequencies in ten banks; one extra monitor bank for search frequencies is present as well. Any channels in memory can be temporarily locked out to avoid hanging up the scanner while scanning. A two-second delay may be programmed into any channel and for search.

Channel one priority may be selected for an important frequency that you don't want to miss while the receiver is on another channel. It is sampled for activity every two seconds, automatically switching over to that channel when activity is present.

While it is theoretically possible to restore the missing cellular part of the 800 MHz band, the surface-mount device (SMD) components and extensive shielding of the microprocessor where the diode is located makes it extremely difficult to do so.

This is clever on Tandy's part. The same chip can be used for cellular frequency reception on export models, yet discourages the restoration in domestic models. And if the cellular scanner ban amendment now in the Senate ever passes, the radio will probably meet the new requirements for FCC certification.

The multifunction LCD window is easily read and it is edge lighted for nighttime visibility as well.

The PRO-43 makes wise use of its battery compartment. Running on six easily-replaced AA cells, the user can elect either to utilize nicads for constant charge/use cycles, or throw-away alkaline cells for long periods of storage followed by hours of active listening when recharging is not practical.

Two power jacks are included, one to charge the optional internal nicads, the other to power the radio from an AC wall charger (9 VDC output at 300 mA, also optional).

A rugged plastic spring clip provides sturdy belt-worn support, and the top-mounted volume and squelch knobs are easily rotated in use. The rubber flex antenna is equipped with a BNC base for replacement by a mobile, rooftop or telescopic antenna for greater reception range.

While rated sensitivity (1 microvolt FM, 2 microvolts AM) may seem rather insensitive, in actual listening we noted no real difference in reception between the PRO-43 and other handheld scanners which advertise better sensitivity.

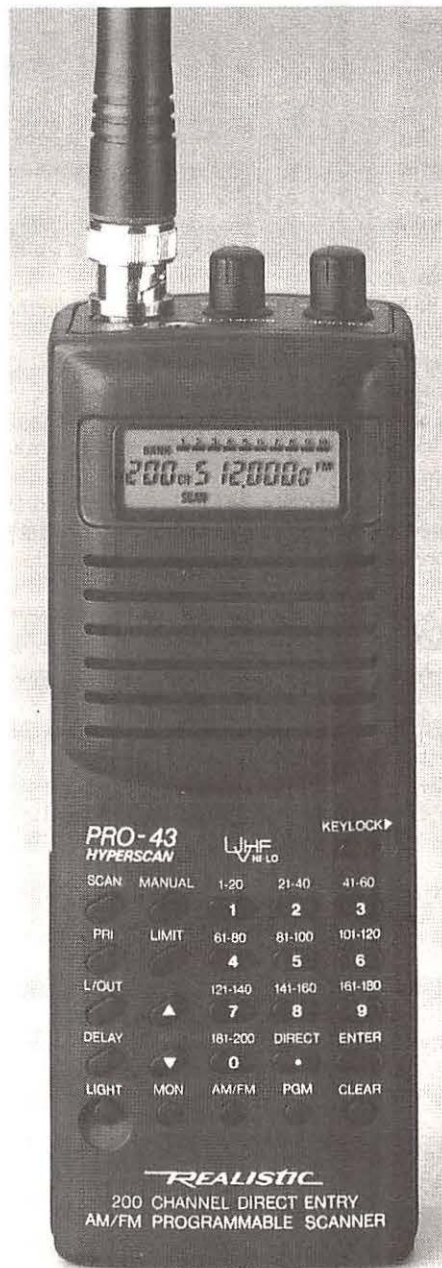
It is possible that the unit is purposely rated conservatively to account for variance in production units, or that slightly reduced sensitivity means better rejection of intermod in dense signal environments.

The PRO-43 utilizes triple conversion (610, 48.5 MHz, 455 kHz). Adjacent channel selectivity (+/-20 kHz) is 50 dB, quite respectable in a dense signal populations.

Audio output power into its internal speaker is 250 mW; and earphone jack is provided. Sound quality from the internal speaker is somewhat bassy, but certainly understandable.

The Bottom Line

We expect the new PRO-43 to be a fast seller, especially now that the popular PRO-37 has been discontinued. The unit should be on dealer shelves by the time you read this review. Price is \$349.95 from Radio Shack outlets nationwide, less batteries and AC wall adaptor.

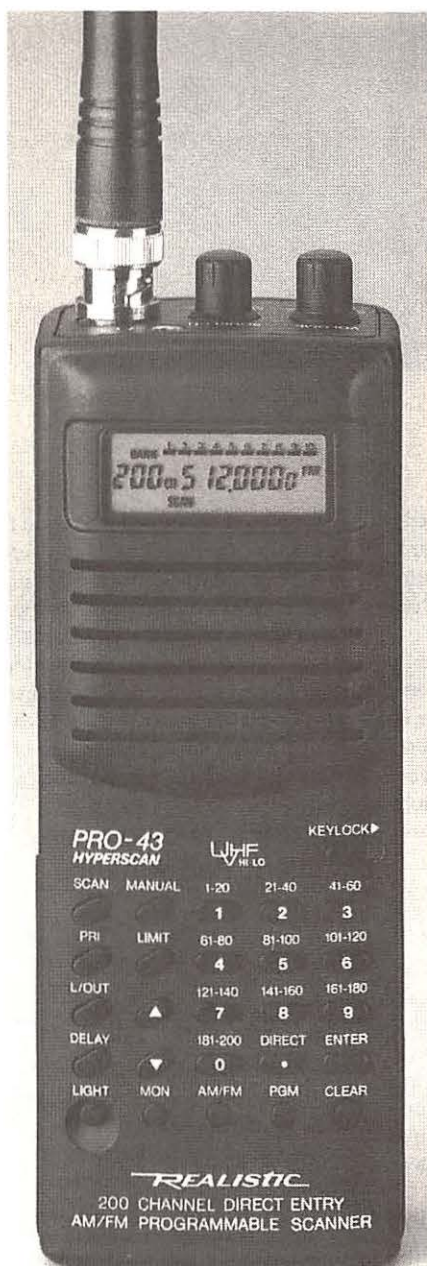




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Frequency Ranges: 30-50, 118-174, 220-512 and 806-999.9875 MHz (less cellular)
 Scan Rate: 25 channels per second
 Search Rate: 50 channel per second
 Search Steps: 5, 12.5 or 25 kHz
 Delay: programmable, 2 second
 Memory: 200 channels in 10 banks plus one extra monitor bank for search frequencies
 Display: Multi-function, edge-lit LCD
 Power: 6 AA cells (NiCads or Alkalines)/ AC power supply/9 VDC
 Antenna: Rubber flex antenna with a BNC base
 Dimensions: 2-3/4"W x 5-3/4"H x 1-5/8"D
 Weight: approximately 9 ounces

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Optional Accessories:

ACC47 - AA NiCad Batteries: \$1.95 each
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Lowe's HF-150 — A Real Winner!



At last, here's something substantially different—different, as in, “Why hasn't somebody done this before?” Well, now they have and it's cause for real celebration.

Britain's Lowe Electronics has just released its new model HF-150, a nifty little tabletop receiver with batteries. It's a serious tabletop communications receiver built to near-professional standards of toughness—yet, it is actually small enough to function perfectly well as a portable. What a gem, and priced at around half what most communications receivers go for!

The '150 receives in the LSB, USB, AM and synchronous AM (USB, LSB, DSB) modes from 30 kHz to 30 MHz—but not FM 88-108 MHz. It runs off an outboard AC power transformer or eight inboard “AA” batteries. A charging circuit is included for NiCd cells, which nominally operate the '150 for four hours per charge.

“Portable Tabletop” Communications Receiver

At slightly over three inches in height, the '150 is significantly plumper than most portables. Yet, its modest 7" x 7" footprint produces an overall cubic volume roughly equivalent to that of the Sony ICF-2010. With batteries charged

and the optional telescopic antenna attached, you can carry the '150 around your home or yard almost as easily as an ordinary mid-sized plastic portable. You can't even think about doing that with other communications receivers.

Although this rugged receiver makes sensible use of advanced technology, it has a mere five controls, reflecting Lowe's passion for keeping things functional and straightforward. On the front is a volume/on-off knob, a 1/4-inch jack for headphones, three pushbuttons, a tuning knob and an LCD with clearly legible numerals. Unfortunately, when the receiver is placed on a table, the vertical face and non-elevated front of the '150 make the LCD hard to read and, to make matters worse, it is not illuminated.

On the back of the '150 are two hatches for slide-out battery trays; connectors for coaxial and wire antennas; an antenna selector switch/attenuator; plus connectors for external power, an external speaker, record output and an external keypad. A 2-3/4 inch speaker is mounted atop of the cabinet, facing upward. It performs pretty well, although a good outboard speaker is better yet.

The dimpled metal tuning knob, basically of high quality, is nonetheless stiff to turn. Because of this and the radio's light weight, the

'150 tends to slide around when you fiddle with it. In addition, the three pushbuttons are mounted low on the cabinet, which makes for unhandy use when the radio is sitting flat. Propping up the front of the '150 with a paperback helps in a number of good ways: the receiver tends to stay put when being tuned; controls are easier to use; and the display is easier to read. Clearly what is missing here is a much-needed pair of flip-down feet for elevating the front of the receiver.

Top-Notch Audio Quality, Excellent Performance

The '150 sounds very good. This, plus fade-reducing synchronous detection, produce audio quality that is right up there with Lowe's highly rated HF-225 and the superb-sounding Drake R8.

Sensitivity is above average, as is dynamic range. Front-end selectivity, however, is only fair—this is not a receiver to operate in the shadow of a local AM station. In short, overall performance is far better than portables; and close, if not quite equal, to the best communications receivers.

The '150's wide bandwidth is 6.5 kHz with an excellent shape factor, while the narrow is 2.6

kHz with a good shape factor. The narrow bandwidth works very well for selectable-sideband and single-sideband reception, but is too constricted for regular world band reception in the AM mode. The wide bandwidth, on the other hand, works well for AM-mode listening, but occasionally lets in adjacent-channel interference that would be avoided by a slightly less broad bandwidth—say, between 5.5-6.0 kHz.

Sensible Controls

The '150's controls use a sequential rotary scheme, which in principle can be a pain—witness Drake's R8. However, because you can operate the '150's controls both forwards and backwards, much of the curse is taken off having these selections on a rotary. You're never more than four button pushes away from the selection you want and the programmable channel memories are easy to use.

Going from band to band is equally easy. If you press the "FAST" button, the two right-most digits of the frequency display are blanked and the receiver mutes. Spin the tuning knob and the remaining three digits zip along. Press that "FAST" button again and the receiver goes to the new portion of the spectrum you have selected.

The '150's optional keypad is, hands-down, the world's best. It sits on your table, like a computer mouse, at the end of a 22-inch wire. To enter any frequency between 3-30 MHz, just tap in the numbers—no decimals, no leading zeros—and the station appears. You can also use the keypad to access any of the receiver's 60 programmable channel memories which, by the way, store not only frequency, but also mode.

In fact, the keypad is so handy that you'll want to use it for portable operation as well. The rub is that the keypad dangles, like a yo-yo. A bit of sticky-backed Velcro, available at local stores, solves the problem.

Superior Synchronous Selectable Sideband

The '150 is one of an elite group of tabletop and portable receivers that can fight fading distortion by using synchronous detection. Synchronous detection removes the transmitted carrier from the signal and replaces it with one of local quality generated by the receiver. The '150's excellent synchronous detector allows you to listen to both sidebands when the signal is "in the clear," but more to the point, it also allows you to select either lower or upper sideband to move away from interference from an adjacent station.

Most receivers with synchronous detection howl if you turn the tuning knob without manually switching off the sync first. Or they will switch out of synchronous mode until you select it again. But with the '150, when you turn the tuning knob quickly the receiver automatically switches into AM (non-synchronous) wide so you can bandscan normally. Quit tuning, and it automatically reverts to synchronous wide. A great idea, well executed.

The '150 also features variable-rate incremental tuning—tune slowly, one speed; faster, the radio tunes six or eight times quicker. Whether this is a plus or minus comes down to a matter of taste.

Alas, the '150's frequency readout is, in the Lowe tradition, only to the nearest kilohertz. Too, the '150 offers none of the controls that DXers cherish: passband tuning, notch filter, AGC controls, adjustable noise blankers and such. There isn't even so much as a signal-strength indicator!

Surprisingly Low Price

Yet, for the program listener—or DXer in need of a portable that's a "real radio" with serious performance—the '150 is welcome news, indeed. At \$599 plus keypad, it's thoroughly affordable, outperforms any plastic portable around, and has performance comparable in many ways to even the best tabletop models.

Lowe Now Available in North America

More good news is that you no longer have to order Lowe products from the factory in England. The '150 and other products are now distributed in North America by Universal Radio and Electronic Equipment Bank (both MT advertisers), which are also equipped to handle all service requirements.

The Bottom Line

The Lowe HF-150 stands apart from the common herd. It's a superb program listener's radio that sets a new standard in combining genuine tabletop performance with portability, and it's priced to move.

This is exactly what many of us have been waiting for. Why resist?

MT

Tone and Code Finder



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The Tone/Code Finder is composed of a high speed display unit mounted to a scanning receiver. Its purpose is to instantly find and display all CTCSS and DIGITAL codes, including split channel and inverted codes.

On board memory retains all hit and time information which is then transferred to a printer via a RS 232 port upon command. Time is stored in seconds and hits in units. In the event of power loss, the FINDER will maintain memory for up to three weeks.

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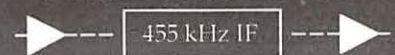
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Taking Back Control

As in the brilliant and far sighted work by Arthur C. Clarke, 2001—A Space Odyssey, sometimes the computer has to be shut down to yield to the needs of the humans that are using it. So this month we turn off the computers, decoders and interfaces and look to the users—you, the readers—for the control of the column.

Let's start with a letter from a reader in a country where they know how to mix their work and play in proper proportions—France. Mr. Dussert writes:

"Being interested in controlling an ICOM R71E by a computer, I would like to know if the Datametrics Software may run into a palmtop PC compatible computer like the HP95LX of Hewlett Packard. My interest is to transfer the Datametrics Software into the RAM card of the 95LX via an internal floppy disk drive and then connect the Datametrics hardware to the serial port (RS232) of the 95LX."

The HP95LX palmtop is virtually a miniature XT since it uses the NEC V20 CPU which is more or less an 8088 in disguise. The Datametrics, Inc., Communications Manager Version 4.02, which we reviewed in this column in March, comes with an interface which must be connected to a serial port.

The first problem comes from the 25 pin DB connector which the Datametrics' interface has on it. This is a standard serial connector which is common on most PCs, along with a 9 pin version. Adapters are available to allow these two to be interchanged. HOWEVER, when the PC was designed it was not envisioned as a small profile portable, let alone a unit which could fit in one's hand. Therefore, these connectors are too large for the HP95LX. I think HP has fitted a special serial connector to the HP95LX but it will still require a custom made, homebrew adapter for use with the Datametrics' interface, or any standard PC serial port interface.

A second problem, which is potentially more serious, is that in the HP95LX specifications the RS-232 serial port is identified as a "...three wire interface..." This means that not all the control lines available on a full RS-232 port are included in the HP95LX. This may have been done to reduce the size and complexity of the connector so it would fit in the palmtop case. The control

lines, or handshaking lines, used by Datametrics and some other manufacturers determine the condition of the receiver's squelch; "signal present"=stop scanning or "no signal"=continue scan. The Datametrics' interface uses Request to Send (RTS) and Data Carrier Detect (DCD).

I couldn't find out for sure if the HP95LX provided these signals. However, HP does sell a "Conductivity Pack" Model F1001A which you will require to solve the connector mismatch problem.

In summary, there is a good chance that with the Conductivity Pack Communications Manager could be used with the HP95LX. But my advice is: purchase it only with the guarantee of a full refund if those control lines are not present.

Well, back to the USA and Norman whose listening shack is in Hillside, New Jersey.

"The reason I am writing you is that I am interested in Telcom's Code 3 advertisement on page 105 of the March issue of Monitoring Times, and I would like to know if you are familiar with this product? I would like to know your opinion on what it says it does and doesn't. Are there other programs that do what the Code 3 does only at a more inexpensive price?"

Norman, I've tried to contact TELCOM and have left two messages on their answer phone with no reply. As for other packages that do what TELCOM CODE 3 Radioteletype and Data Communications package claims to do, Software Systems Consulting's "PC SWL" program comes to mind. It does not decode quite the wide range of modes that CODE 3 claims to decode, but it does decode more than 50% of those listed by CODE 3, and they are the most commonly encountered on the shortwave bands. In addition, PC SWL has a built-in oscilloscope feature for "looking" at mystery intercepts and comes with an extensive reference manual.

I have encountered some problems with the time it takes to synchronize with FEC and AMTOR signals. I am sure the people at SSC will contact me about this minor problem in the near future so we can do a full review of PC SWL. Software Systems Consulting also makes the excellent "PC HF FAX" which we reviewed a few months ago in the April 1992 issue. By the way the price of \$99.00 for PC SWL should make you smile,

Norman, relative to Code 3's price tag of over \$785.00! If the TELCOM guys are listening, I'm still waiting for your call.

John P. from Sunnyvale, California, says, *"I am writing to obtain a copy of the two database programs you mentioned in the March 92 issue of MT. The two programs are RAC and Radiolog. You mentioned that you only needed one disk even though there are two programs. If one is not enough please send me a copy of the program you like best. I understand that these programs are shareware and will donate to the author if I like them."*

John, "Radiolog" is being made available by Bob Kay at Monitoring Times if you can't find it on your local BBS. If you send a blank 5.25 inch floppy disk and a return mailer with 73 cents to P.O. Box 173, Prospect Park, PA 19076, you'll get your copy. But do it quickly as Bob is only offering this for a limited time.

As you point out, and we described in our June 92 column, the author of this program is not giving it away free. It is a "you get it, you try it, you like it, you pay for it" deal. Also see previous "Computers and Radio" columns for other database program reviews whose prices are very competitive with the shareware programs.

And now a tale of woe, not uncommon in the software industry and one of the main reasons for the existence of the "Computers and Radios" column. Here is Darryl of Holland—not the country, but a city in the state of Ohio. The condensed version of his letter starts,

"...In April of 1990, I purchased a software package from DataCom, Miramar, FL. I had been looking for a program to control both my Icom R7000 and R71A. After seeing the demo at the Dayton Hamvention, I purchased the \$300+ program, which included the software and hardware interface."

"To make a long story short, the software is full of programming bugs and was extremely disappointing. I called numerous times about this, but the end result was that it just didn't do any good. Some parts of the program won't even work, such as the diagnostic section, which I paid extra for. After many, many calls, I just gave up."

"Then, in April 1991 at Dayton, DataCom

had their display there again. I confronted them about these problems (I noticed that I wasn't the only one there complaining). They said that I could have a free copy of the new DataCom V package, and that would solve all my problems. When I got home, I read all the documentation, installed the program.....and it wouldn't even run!

I'm not the only one experiencing problems with DataCom. My neighbor purchased a package from him to control his NRD-525 shortwave radio. It's also full of problems..."

Daryll, my man, I started buying and trying SWL software back in the 1980's while I was still working overseas. The cost of the telephone calls to these early software manufacturers could fill a shack with ICOM equipment! Most of their goals were ambitious and far-sighted. In fact, too ambitious for the complexity of the job, their resources and the time available. But Daryll, this is nothing new for an emerging industry with a revolutionary product whose market previously didn't exist. They were true business explorers.

However, at some point the buyer expects and demands the delivery of a product and not a farsighted promise. It has been the painful and expensive experiences I have encountered, tempered by the joy of well-produced software that has motivated me to write this column.

Neither I nor others with whom I have spoken have been able to contact Datacom. There is a saying that the death of a species is nature's way of saying it didn't fit anymore into its environment. In business it's the same thing, only it's called bankruptcy.

When I review a piece of software, I expect to run it through its paces. If I find a major problem I notify the manufacturer and allow him a few weeks to send me a fixed version, remove the "bugged" version from the market and issue the fix upon the customer's request. If this is not done, the "bugs" are reported to you readers. Daryll, by being a faithful reader of this column, I hope you never have to go through that expense and frustration again.

Okay! It must be time to close the column since my computer is asking why, if humans are in control, is he still turned on?

I hope you found last month's column useful in predicting the terrible propagation conditions which occurred in the early part of May. For almost two weeks HF was predicted by these programs to be dead, and it was, in fact, useless. The ionosphere really slammed the window on HF! Let me close this month by thanking all those readers who have contributed to the column with letters and good wishes.

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Homebrew Antenna Hardware

Have you priced antenna hardware lately? Even the mundane insulators for wire antennas are costly when one considers the material from which they are made. Also, some day-to-day antenna hardware items are not easy to find. Center-insulator blocks are but one example.

Good fortune surrounds us when it comes to making our own insulators, open-wire feed line and such. This is because readily available materials can be used to fashion almost anything we need for an ordinary antenna system. Generally speaking, the raw material we need can be obtained at the local hardware or discount store. Here are some suggestions that you can consider when you start that next antenna project.

End Insulators

I often use plastic coat-hanger material for the end insulators on my short wire antennas. These hangers can sometimes be purchased for as little as 15 or 20 cents apiece. The stock is approximately 3/8 inch in diameter. The hangers can be cut into 3-inch lengths, drilled at each end and used in the same manner as commercial insulators.

Plexiglass, Lexan and other low-loss plastics also work well as insulating material. I recommend stock that is 1/4 inch thick or greater. I cut the plastic into strips that are 3 inches long and 1 inch wide. I drill a 3/16 inch hole in each end of the strips. It is wise to chamfer the edges of the holes to remove sharp edges. This helps prevent breakage of the wire from wind stress.

Old time radio amateurs often used wooden dowel rods for antenna insulators. I have also used wood in emergencies. The wood should be treated by boiling it (after the holes have been drilled) in canning wax for 15 or 20 minutes. This impregnates the wood with wax and prevents it from absorbing moisture and becoming lossy. I have used wood, treated in this manner, for center insulators in dipole antennas.

Don't overlook those plastic hair-curling rollers for use as insulators. They are inexpensive and quite durable. Another lowcost insulating material is 1/2 - or 3/4-inch OD PVC pipe. The list of suitable materials goes on and on. Let your imagination work toward minimizing your insulator expenses!

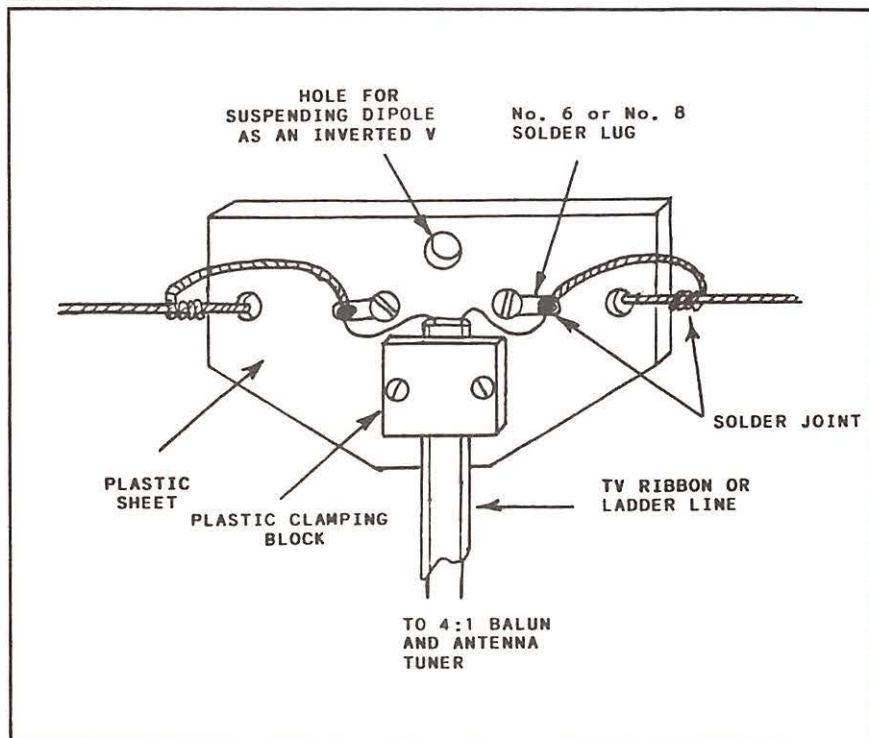


Figure 1: Details of a homemade center insulator for dipoles. A balun and a tuner permit multiband operation. The feed line may be RG-58 coax if single-band operation is desired, thereby eliminating the need for a balun. Dipole should be dimensioned for the lowest proposed operating frequency in MHz. Length (ft) = $468/f(\text{MHz})$. This center insulator can be made from fiberglass, Plexiglass, Lexan and similar durable plastics. Wood boiled in canning wax (see text) may also be used.

Center Blocks for Dipoles

Figure 1 illustrates the format I have adopted for home-made center insulators in dipoles and end-fed Hertz antennas. Most of the aforementioned insulating materials may be used for making your center insulators. Please note in Figure 1 that a clamp is used to affix the feed line to the insulator block. This aids in preventing broken wires at the antenna feed point and stabilizes the junction of the antenna and feeder. A metal clamp is suitable for securing coaxial cable. A flat plastic or wooden slab can be used to anchor 300-ohm or 450-ohm line to the block.

It is not uncommon for ladder line or 300-ohm TV ribbon to break at the feed point (from wind stress and subsequent flexing) over time. The line may appear intact when inspected, because the wire breaks inside the insulation. You can practically eliminate this problem by paralleling a 2-foot section of the same type of feed line at the feed point. The extra piece of line is soldered to the feed point and again at a spot that is 2 feet below the feed point. The two lines are then taped at six or eight points to keep them together.

This does not disturb the feedline impedance sufficiently to be a matter of concern at frequencies up to 30 MHz. Most 450-ohm ladder line contains no. 18 copper-weld wire (single strand). It does not take long for this wire to crystallize from flexing in the wind. It is this condition that causes the wire to break easily. The parallel line section minimizes flexing.

The holes in your center insulator should also be chamfered to remove sharp edges where the antenna wire passes through the insulator.

Base Insulator for Ground-Mounted Verticals

Figure 2 shows a simple way to insulate the bottom end of a ground-mounted HF-band vertical antenna. A glass bottle is set in the ground a few inches and the antenna is placed over the neck of the bottle. Guy lines (nylon) are necessary for keeping the antenna erect and firmly seated on the bottle. I have built a number of 20- and 40-meter verticals in this manner.

The driven element of the antenna was fashioned from sections of steel or aluminum downspout pipe. The joints in the driven element were pinned together with sheet-metal screws and soldered. Small eyebolts were installed in the downspout near the joints (three eyebolts at each place) to provide connection points for the guy lines. A one-gallon jug works nicely as the base insulator for antennas made from downspout.

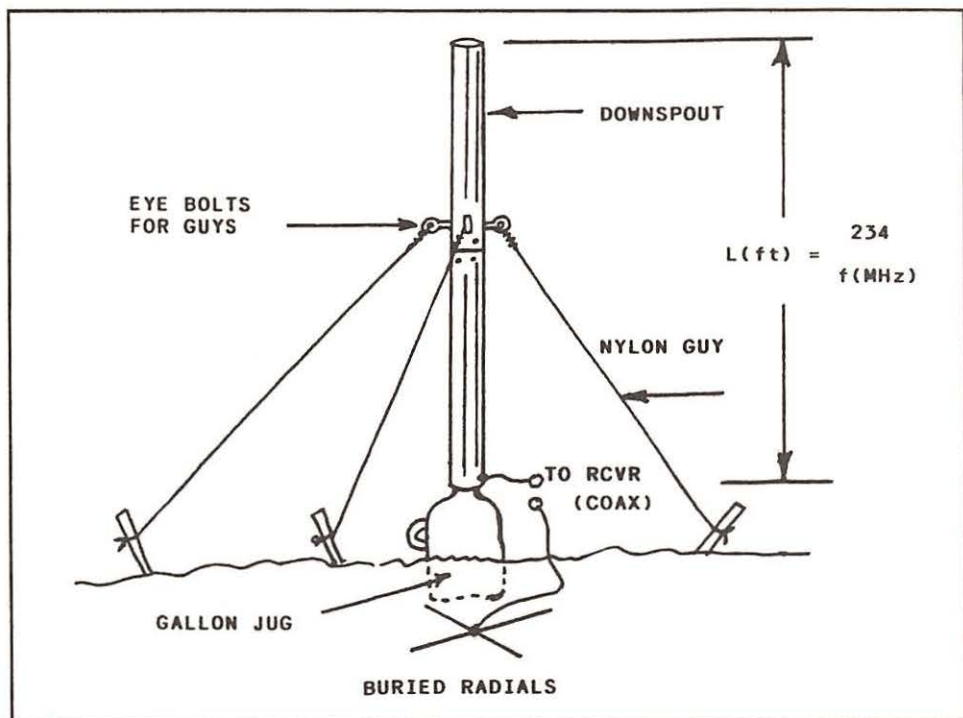


Figure 2: Example of a quarter wavelength vertical antenna that uses a glass jug for the base insulator. The radial system may consist of four 1/4-wavelength above-ground radial wires. The radial wires may be buried 3 inches in the ground if desired. There should be at least 8 in-ground radials if this method is used. The feed impedance of this antenna is on the order of 30 ohms. RG-58 coax cable may be used as the feed line. The SWR will not impair reception.

Protection for Loading Coils and Traps

Dirt and moisture are the enemies of unprotected loading coils and antenna traps. They can change inductance and become lossy if allowed to accumulate dust and air pollutants. My first step in the protective process is to apply two coatings of spar varnish, Glyptol or exterior polyurethane to the coil winding.

Further protection is offered if you cover the coil with a plastic sleeve. I frequently employ a quart size plastic soda pop bottle. I cut out the bottom of the bottle and slip the neck of the container over the antenna wire or tubing until it rests against the top of the coil. The neck end of the bottle may be sealed over the wire by filling it with caulking compound or Coax Seal. A variety of plastic drinking glasses and refrigerator containers are also fine for this application. They are available in the household/kitchenware departments of most variety stores.

Cheap "Tubing" for Antennas

The present cost of aluminum tubing is frightful. You can avoid this expenditure if you're willing to construct an "ugly antenna." An inexpensive short vertical (10 or 6 meters, for example) can be fashioned from 3/4 inch PVC tubing and aluminum foil. Wrap the tubing with Reynolds

Wrap or equivalent (heavy duty type) in a continuous wrap. Tape the foil to the tubing at several points to keep it in place. A metal hose clamp may be attached to the base of the vertical to provide the connection point for the feed line. Longer vertical antennas can be made in a like manner by wrapping aluminum foil around a long bamboo fishing pole.

Magazine articles have been published to show how an HF-band Yagi beam antenna could be built in this fashion. The longevity of these antennas is much shorter than for an equivalent antenna made from aluminum tubing. But, it's an inexpensive means to an end, and antennas of this type should last a few years.

I have built a number of long, helically wound verticals by placing the winding on a 16-foot wooden handrail that I bought at a lumber yard. The wood was first treated with three coatings of exterior spar varnish. The completed winding was also coated with spar varnish.

In Summary

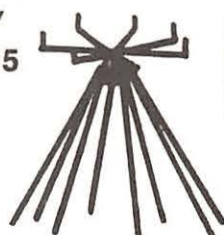
These hints can save you a lot of money, especially if you are an antenna experimenter (who isn't?). The important message here is that there is no reason to say "I can't afford to build antennas." Equivalent commercial antennas can cost ten times or more the amount you invest for a home-made radiator.

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One major advantage of the Data/Tone Squelch (DSQ) is that you don't have to lock-out trunked data channels when monitoring 800 MHz SMR systems! These data channels can change as often as twice a day, which complicates manual lockout methods. The DSQ is also very effective against cellular data, most continuous tones & warbles, DES/DVP encrypted signals, Improved Mobile Telephone Service (IMTS) tones and most other non-voice signals, including digital pagers! My DSQ will even recognize heavy static! In other words, the DSQ discriminates against all but two kinds of signals: voice and silent or dead carriers!

The latter is okay because the PRO-2004/5/6's unique SOUND SQUELCH (SSQ) function takes care of silent, unmodulated signals. In fact, the DSQ works with but is independent of the SSQ except that the SOUND SQUELCH button on the front panel activates and deactivates both functions. Two small switches provide independent control of SSQ and DSQ!

Construction & installation of the DSQ are well within the capability of most hobbyists, but you should have the Service Manual for your scanner before doing this modification. Order it from any Radio Shack store or see the sidebar for direct orders.

Construction of the Circuit

Build the DSQ circuit on perf board about 1" x 1-1/4" though smaller is ok if you are good at micro circuits. Refer to the schematic diagram, the pictorials of the parts layout, and the Parts List. Use an IC socket (XU-1) for U-1 and don't plug in U-1 until the board has been finished and checked for errors. Note that Pins 1, 6, 7, 8, 9, 10, 11, 13 & 14 of U-1 are not used. Snip those pins from XU-1 before inserting the socket into

the board so that more room is available underneath. Attach a stiff bare copper wire (#18 ga) to the ground trace of the board. First, loop it through the holes in the perf board to rigidly fix it in place and then solder it to the main ground trace of the DSQ. Leave about 1-1.5" inch of this bare wire free. It will simplify installation of the DSQ board in the scanner.

Solder a RED hookup wire to Pin 3 of XU-1; solder a YELLOW hookup wire to the junction of D-1 and D-2. Solder a WHITE hookup wire to the anode of D-4. Solder an ORANGE wire to the cathode of D-4. Solder a BLUE wire to the cathode of D-3. NOTE: These wires should be about 6"-8" long.

Construction and layout are not critical and can be varied from my suggestions. Make your board as small as possible, though, so that it won't take up too much room inside the scanner. You may be doing lots of modifications in the future and space might come at a premium. Install the DSQ Board in an out-of-the-way place, though VR-1 must be accessible.

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Solder the (+) leg of C-1 directly to IC-5 Pin 14.

PRO-2005/6 Only

Solder the (+) leg of C-1 direct to IC-5, Pin 7.

PRO-2004/5/6 All

Solder the free end of the YELLOW hookup wire to the (-) leg of C-1. Solder the BARE ground wire on the DSQ Board to the chassis or a circuit ground in the scanner. Solder the free end of the RED hookup wire at Pin 3 of XU-1 to the OUTPUT leg of IC-8, the +5 volt regulator on the main chassis of the scanner. IC-8 is the same in all three, PRO-2004/5/6.

PRO-2004 Only

Locate CN-504 on the Logic/CPU Board, PC-3, and follow its wire bundle to the top of the main receiver board. Locate the sky blue (light blue) wire that connects to the main board at the right end of the row of wires and desolder or clip that wire from the board. (This wire goes to Pin 15 of CN-504.) Let it hang loose for a moment.

PRO-2005/6 Only

Locate CN-3 on the main receiver board and follow its wire bundle up to the Logic/CPU board. Locate the sky blue (light blue) wire that connects to Pin 4 of CN-3. Clip that blue wire halfway between CN-3 and the Logic/CPU Board. Let the two cut ends hang loose for a moment.

PRO-2004/5/6 All

Install two small SPST switches on the scanner's front or rear panel. Front panel installation isn't difficult in the PRO-2004 where there is plenty of room. It's a bit more laborious in the PRO-2005/6 where the Logic/CPU Board must first be removed. (See Vol. 1 No. 2 of the *World Scanner Report* or my

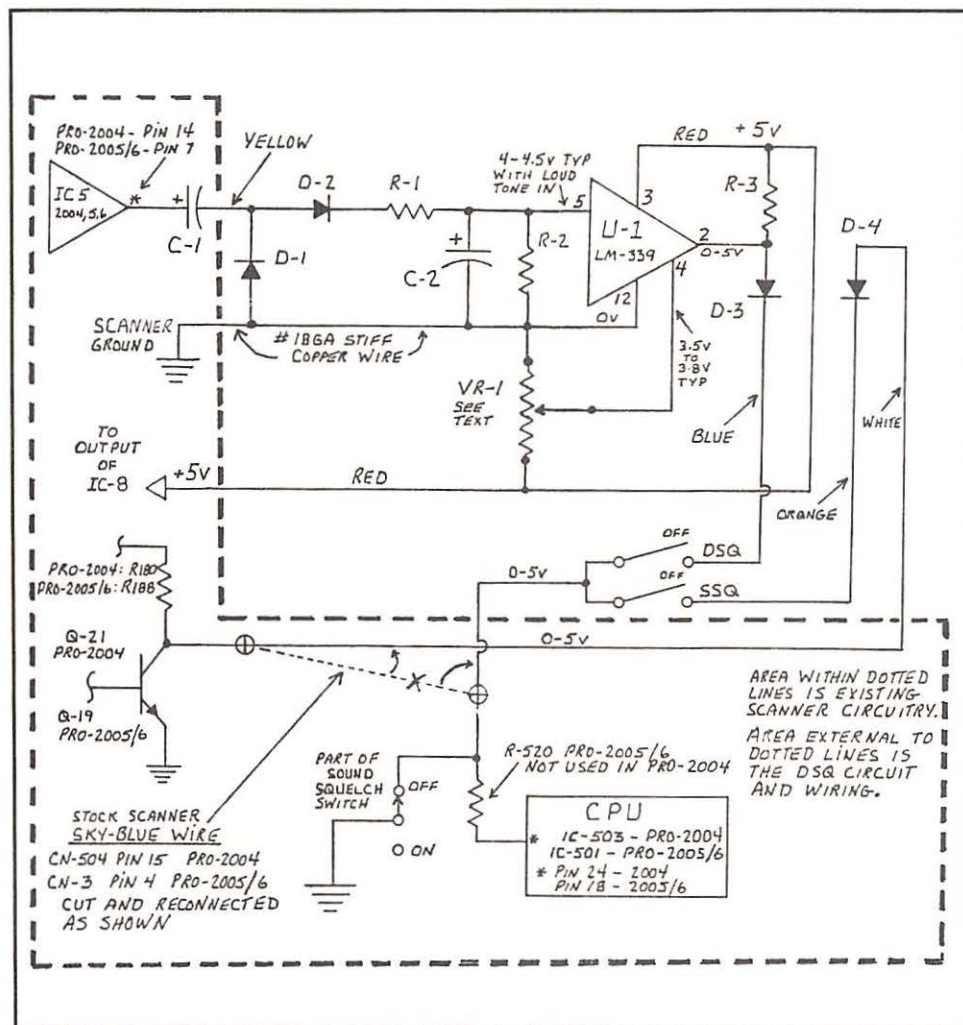


Figure 1: Data/Tone Squelch Schematic and Wiring Diagram

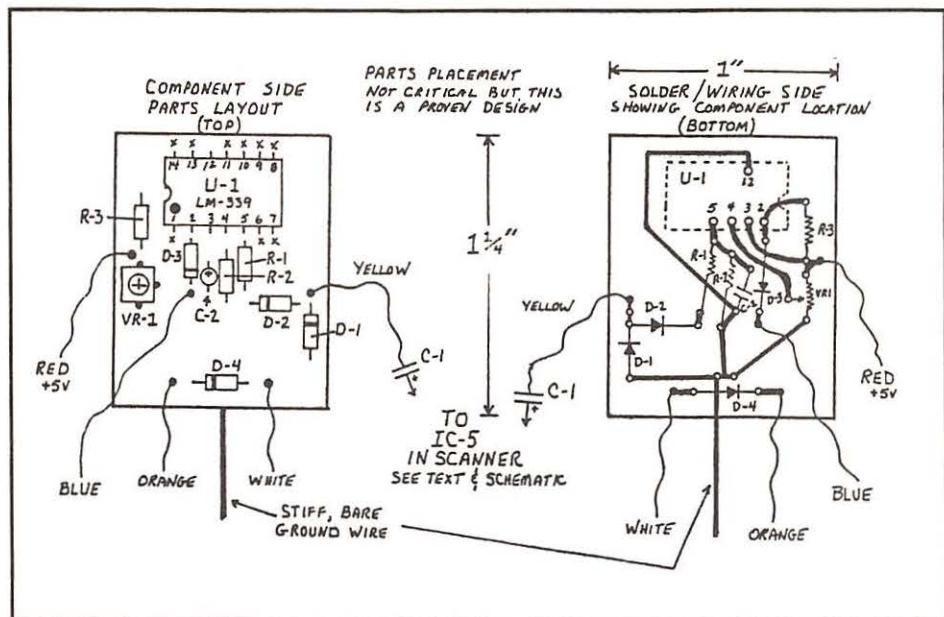


Figure 2: Data/Tone Squelch Parts Layout and Soldering Diagram

Scanner Modification Handbook, Vol. 2. for instructions, if you get stumped.) One neat choice of switch for the PRO-2004/5/6 is a 4+ segment DIP switch. The extra switch segments can be used for other things later.

PRO-2004/5/6 All

Solder the ORANGE wire of the DSQ Board to the bottom lug of one switch. This switch will control the stock SOUND SQUELCH (SSQ) function, on/off. Solder the BLUE wire of the DSQ Board to the bottom lug of the other switch. This switch will control the new DATA SQUELCH function, on/off. Solder a jumper wire from the upper or free lug of one switch to the free lug of the other switch.

PRO-2005 Only

Solder the sky blue wire that was removed from the main board to the jumper wire between the two switches. (Splice and extend this wire if needed.) Solder the WHITE wire of the DSQ Board to the empty spot on the main scanner board where the sky blue wire was removed. Installation is complete.

PRO-2005/6 Only

Splice the WHITE wire of the DSQ Board to the cut sky blue wire that goes to CN-3 of the main scanner board. Splice one end of a hookup wire to the other cut end of the sky blue wire that goes to the Logic/CPU Board in the front panel. Insulate the splices! Solder the other end of this new hookup wire to the common bare jumper wire between the two switches. Installation is complete.

Adjustment of VR-1

PRO-2004/5/6 All

Press the front panel SOUND SQUELCH button ON. Turn the new SSQ switch OFF and the DSQ switch ON. Attach a voltmeter (-) to ground and (+) to Pin 5 of U-1. Program the scanner to a strong, noisy data channel or to a

loud, single tone carrier. Ensure the scanner is in the MANUAL or MONITOR mode; not SCAN or SEARCH. Cellular (879.390 - 880.620 MHz) or trunked data channels (851 - 865 MHz) are ideal!

Measure the DC voltage at Pin 5 of U-1, (4 to 4.5v typical). Calculate 80% of that voltage; then put the (+) voltmeter probe at Pin 4 of U-1 and adjust VR-1 so that Pin 4 is 80% of the value at Pin 5, typically 3.5 to 3.8v. The exact adjustment isn't too critical, but if set too low, voice signals will cause SCAN or SEARCH to resume. If set too high, then data & tone signals won't trigger the SCAN/SEARCH RESUME.

Another way to find the optimum setting is to put a voltmeter (+) on Pin 2 of U-1 and (-) to ground and program the scanner to a cellular or trunked data channel. Adjust VR-1 first one way and then the other and then to a point so that the voltage on Pin 2 of U-1 just becomes stable with a nice and steady +5 volts. It takes a steady 5-volts for about one second to trigger the SCAN/SEARCH RESUME function, but don't adjust VR-1 any further than necessary to stabilize the DATA/TONE voltage at Pin 2.

Operation & Technical Notes

Remember that the SOUND SQUELCH button on the front panel must be ON before either SSQ or DSQ can work. The SOUND SQUELCH button is like a master on/off switch and the two SPST switches control one, the other or both. Minor readjustment of VR-1 may be necessary for optimum results, but the final setting will produce a voltage on U-1 Pin 4 of about 80% of the peak voltage at Pin 5. The DC input signal at U-1, Pin 5, will be nearly zero on silent or quiet signals and about 4 to 4.5v with data & continuous tone signals. Pin 5 will show a very erratic and rapidly changing voltage from nearly zero to 4+ volts on voice signals.

The DC output voltage at U-1, Pin 2, will be nearly zero on silent or quiet signals; and a steady +5v with data & continuous tone signals. Voice signals will cause a rapid fluctuation of the signal between 0-5 volts at Pin 2 of U-1. When the SOUND SQUELCH button is off, neither SOUND nor DATA SQUELCH are operable and scanner operation will be normal.

In Case of Difficulty

Ensure correct pin wiring of the LM-339 chip. Make sure diode polarities are correct (banded end is the cathode). Make sure polarities of capacitors are correct.

The circuit is so simple and affirmative in its action that you're not likely to encounter trouble if you follow these instructions. Some PRO-2005's (not PRO-2004 or 2006) may exhibit a weak chirping or warbling, Morse code type of sound on quiet voice channels after this mod has been done. If yours does this, change C-1 from 1.0-uF to 0.1-uF, Radio Shack #272-1432. If the "tweet" is still there, then solder a 1,000-uF capacitor (RS #272-1032) directly to Pins 4 & 11 of IC-5 in the scanner. Pin 4 should get the (+) lug of the capacitor. This is a peculiar problem in some PRO-2005's, but it's easy to correct.

If you can't resolve a problem, send me an SASE and one loose extra stamp with a complete description of the problem and its symptoms and I'll respond with written suggestions and advice.

Parts List for DSQ Circuit

Ckt	Description w/Radio Shack Catalog Number
Sym	
C-1	1-uF/35vdc Tant; #272-1434; See "Difficulty" text
C-2	2.2-uF/35vdc Tantalum; #272-1435
D1-4	1N4148 or 1N914 switching diodes; #276-1122
R-1	390-ohm; #271-018
R-2	12-k; use 10-k + 2.2k in series if needed
R-3	3.3-k; #271-1328
U-1	LM-339 Comparator IC; #276-1712
VR-1	10-k ohm trim pot; #271-282 or #271-343
XU-1	IC socket, 14-pin DIP, for U-1 above; #276-1999
Misc	Perf board; #276-1395
Misc	Hookup wire; #278-776 or #278-775; salvage the wires!
S1,2	Switch, SPST Toggle Switch, #275-624; see text

Sources

PRO-2004/5/6 Service Manuals

Tandy National Parts Center
900 E. Northside Dr.
Ft. Worth, TX 76106
(800) 442-2425

Scanner Modification Handbooks (Dealers)

Grove Enterprises Universal Radio Inc.
DX Radio Supply
(For above, see ads in this issue of Monitoring Times)

IC's & Electronic Parts

Easy-Tech, Inc.
2917 Bayview Dr.
Fremont, CA 94538

Commtronics Engineering
World Scanning Report
PO Box 262478
San Diego, CA 92196-2478

Digi-Key.
PO Box 677
Thief River Falls, MN 56701
(800) 344-4539

A Frequency-Adjustable VHF/UHF Groundplane

This month we take a look at the MAX System Telescopic Groundplane Antenna (Fig. 1), which can be used useful for either monitoring or two-way communication. Its range—130 MHz to 350 MHz—covers several scanner bands as well as the 144 MHz and 220 MHz amateur bands. The groundplane design of this antenna gives nondirectional coverage, sufficient gain for most applications, and also provides low angles of radiation and reception desirable for VHF-UHF communications.

Chrome-plated elements and a white plastic base give the antenna an attractive appearance. A unique feature of the MAX System Telescopic Groundplane Antenna is that, as its name suggests, the antenna's vertical element and radials are individually adjustable. Collapsing the telescopic elements and folding them inward reduces the antenna's radials and base to a 3-inch by 10-inch size.

This makes the antenna handy for carrying while traveling, and for storage when it is not in use. When it is fully extended and operational the antenna will mount in your attic or other out-of-the-way spot. In operation, the antenna's radials should be drooped as shown in fig. 1.

To optimize the antenna's performance on the frequency of your choice, adjust all the elements to the length given by the following equation:

$$L(\text{in}) = 2808/f(\text{MHz}) \quad \text{or} \quad L(\text{cm}) = 7125/f(\text{MHz})$$

For example, at 150 MHz the length in inches would be $2808/150 = 18.72$, or approximately 18-3/4 inches. Estimating that 1/8 inch of each element extends inside the central plastic body, the equation above indicates that the elements can be adjusted to resonance from about 292 MHz to about 119 MHz.

For transmitting with a 2-meter handheld transceiver I compared the MAX groundplane to a telescopic whip with its length adjusted as indicated by the equation given above. The improvement in transmitted signal strength when using the MAX was about 6 dB compared to the whip, which seems to say something about the inefficiency of a simple whip without radials. The groundplane gave a measured SWR of less than 1.7/1 across the 2-meter band.

For receiving, with the elements of both antennas adjusted to length, the groundplane gave a signal increase over the whip comparable to that found in the transmitting test. This is

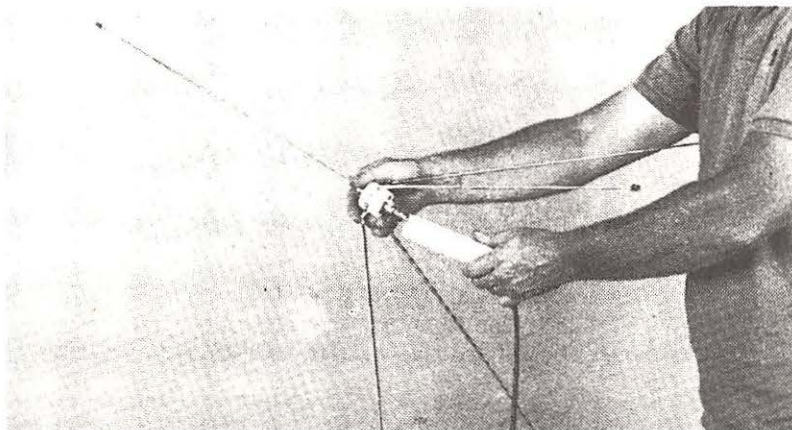


Figure 1: Max System Telescope Groundplane Antenna

about 1 S-unit improvement in received signal strength and represents a significant increase in readability for weak signals. For receiving, the groundplane elements don't have to be adjusted very close to resonance to get good reception.

However, an adjustment of the element lengths from a length far off-frequency to one appropriate for the frequency of operation improved the antenna's response by as much as 6 dB in signal strength. Adjusting the vertical element length accounted for most of this change; adjusting the length of the radials made much less difference.

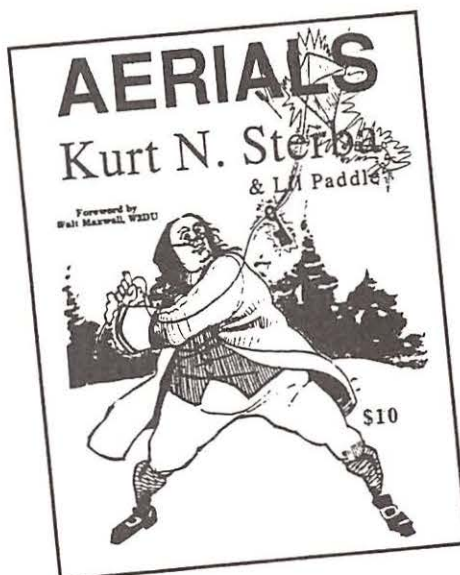
So, if you're now using a simple whip or especially if you're using a rubber duck on your scanner, moving up to this antenna should give your monitoring a welcome boost in signal strength. For amateur use on the 2-meter and 220 MHz bands this antenna is an excellent performer. As always at VHF-UHF frequencies, for best results use a low-loss feedline between the antenna and your receiver or transceiver.

In their recent catalog, the MAX System Telescopic Ground Plane lists for \$29.95 + \$4.00 shipping from Cellular Security Group, 4 Gerring Road, Gloucester, MA, 01903. Please mention MT when you write them.

Not Just Another Antenna Book

Aerials, by Kurt N. Sturba and Lil Paddle, is an antenna book by two salty "devil's advocates" of the antenna world who have a long tradition of vigorously attacking false information spread about in the guise of antenna theory. It is "must" reading for persons concerned with practical amateur radio antenna performance. You will probably either be mildly offended or pleasantly entertained by the authors' style. I quote the "Disclaimer" appearing in the front of the book:

"This book is sold only for its entertainment or amusement value. The publisher makes no guarantee as to the technical merit of any article. In fact it is rather doubted that any antenna described by the author will work any better than a fifty-ohm resistor dunked in transformer oil, at the bottom of an elevator shaft."



Q. *If it's 0300 GMT here in the Eastern time zone, what time is it in London? (Rob Sabato, Jr., Bloomfield, NJ)*

A. It's 0300 GMT in Eastern, mountain, and in Russia and Australia—everywhere. GMT stands for "Greenwich Mean Time"—the time it is at Greenwich Observatory, just outside of London. This time standard was adopted more than a century ago, but has now been retired in favor of Universal Coordinated Time (UTC).

Every place on Earth has two times, its own local time (whether standard or daylight savings) and UTC. The local time steps one hour for every 15 degrees of longitude, earlier toward the west and later toward the east.

But UTC is the same around the globe, and is based on the sun's position on the Prime Meridian, the 0 degree line of longitude which extends between the north and south poles and which passes through Paris and London, the former centers of science when the standards were adopted.

The International Date line is exactly 12 hours away on the opposite side of our earth (180 degrees longitude); thus, when the sun is overhead on the Prime Meridian, it is midnight on the International Date Line.

Q. *What is the frequency for the Federal Protection Service in Phoenix? One of my friends told me to search the 142, 162, 168, and 410-419 MHz ranges. (Robert E. Brock, Phoenix, AZ)*

A. Your friend was close on the last one. The Federal Protection Service (FPS), a branch of the General Services Administration (GSA), is charged with providing security for federal buildings around the country and is most often heard on 417.200 and 415.200 MHz.

Q. *Why do scanner manufacturers not include the feature found on the earlier Bearcat BC350 that would let the user know how many times the scanner stopped to monitor activity on an active search channel? (Bill Burns, Gary, IN)*

A. The Bearcat "count" feature was innovative, but short lived. Shortly after the appearance of the BC350 and the Compuscan, Electra sold their interests to Uniden who discontinued the more expensive models. Since Uniden controlled

patents for those features, other companies avoided them as well.

Q. *My parents have an antique RCA 62 radio. Where can I find out more about it? (Paul O'Connell, Amherst, MA)*

A. Send for a free sample copy of *Antique Radio Classified*, PO Box 2, Carlisle, PA 01741. It is the leading publication of its kind and lists hundreds of sources for vintage radios, parts and publications.

Q. *Has any reader any information on the Heath model AC-1 antenna coupler circa 1959, especially the tuning range or coil inductance? The tuning capacitor is 250 mmF. I would appreciate hearing from anyone who can help. (Henry E. Jonson, K4IPY, 7201 Capitol View Drive, McLean, VA 22101)*

A. If you don't hear from anyone, you can figure it out yourself. The approximate inductance in microhenries is found by squaring the number of turns (multiplying that number by itself), then multiplying that by the diameter of the coil in inches, and finally multiplying by 0.01.

For the value of tuning capacitor you show, the inductance must be at least 50 microhenries to tune 1.8-30 MHz; if it is about 15 microhenries it is only capable of 3.5-30 MHz.

Q. *Is there a more recent technical guide to building metal detectors than E.S. "rocky" LeGaye's Metal Detector Handbook? (Mike Curtis, PO Box 2768, Twin Falls, ID 83303-2768)*

A. None of which I am aware; anyone out there know of one? Frankly, I doubt that there is. Very few hobbyists build their own detectors anymore, so the demand for such an extensive item would be minimal.

Q. *I don't understand all of the functions on my cellular telephone. What do RSSI, SAT and SID stand for? (P. Loo, Montreal, Que)*

A. Without knowing the brand of your cell

phone, I can only find out two of them. RSSI stands for received signal strength indicator, a form of S meter. SID identifies which cell site (tower) you are working through. Neither I nor Cellular One has any idea what SAT is.

Q. *What harm is done to components of scanners, camcorders and other solid-state devices by airport security metal detectors and X-ray machines? (David Theline, Chantlers Valley, PA)*

A. Absolutely none whatsoever. We checked on this a couple of years back and learned that there is far less radiation than even dental X-rays emit. Travel with the security of knowing that the electronics you are carrying are OK, then you can concentrate better on worrying about the airplane.

Q. *What device is used inside multi-plug electrical extension outlets for surge protection? (Bob Fraser, Cohasset, MA)*

A. Most often a metal oxide varistor (MOV) which shows high resistance to normal voltage, but responds quickly in the presence of a sudden voltage spike by becoming low resistance, momentarily shorting out that pulse to prevent it from reaching the protected appliances.

MOVs have a long life, even after repeated transients events.

Q. *Recently a neighboring teenager was apparently abducted. Is there any kind of personal locating device or beacon which could be attached to a person which could be activated in an emergency? Perhaps something on a police frequency? (Allan Twamley, Mississauga, Ont)*

Q. Because of the low power of such devices, all systems now in use—such as those for prisoner release monitoring—need a nearby receiver. What would happen if the child is abducted far from the receiver? A wide-area monitoring scheme with satellite receivers such as that use for stolen vehicle location would be one very expensive answer.

The FCC is quite specific about what can be used on police allocated channels, and telemetry isn't one of them. False alarms could compro-

Bob's Tip of the Month

Portable Computer Databanks

Several readers have suggested using pocket electronic address books like the Sharp Wizard for frequency database use, provided the hobbyist can get around the limitations of memory and sorting capability.

Bruce Heatley of Buffalo, New York, uses the \$500 Cannon Starwriter 80 to do sorting on a column basis. He can sort only 150 entries at a time in blocks, but has over 550 entries in his Starwriter which features its own built-in, bubble-jet printer.

Perhaps readers are familiar with other comparable systems that offer compact portability, power and low price.

mise emergency communications. A separate radio system would probably be necessary.

And what about the willingness of an independent-minded teenager to wear such a device? Macho males and cosmetic-conscious females would probably fight such a scheme tooth and nail.

But the point is well taken and the problem needs to be addressed. Perhaps high-density batteries and jewelry disguise would be an approach. Reader comments are welcome.

Q. Can the new digital cellular phones be monitored with a computer interface hooked to a scanner? (John Kurys, Spirit River, Alberta)

A. No. The speech is constantly being digitized bit by bit and rearranged. To listen to the contents once the computer properly identifies the algorithm (coding scheme), additional digital and analog circuitry would be necessary.

Remember, any mobile telephone communications are protected from uninvited monitoring by the Electronic Communications Privacy Act (ECPA) of 1986.

Q. Is there an increase in battery discharge when you play a portable radio or scanner at high volume? (Hugh Waters, Singapore)

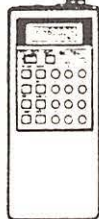
A. Yes, typically 50-100 milliamperes.

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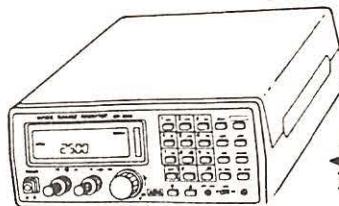
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BC-855XLT, 50ch, 29-54, 108-174, 406-512, 806-956.....	209.00
AR-1000XLT, 500KHZ-1.300MHZ, 1000ch, Cellular.....	395.00
AR-2500, 1-1,500MHZ, 2016ch, Cellular, etc.....	465.00
AR-3000A, 100KHZ-2036MHZ, 400ch, Cellular.....	959.00
ICR-1 100KHZ-1.300MHZ, 100ch, Cellular.....	529.00
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Club Circuit

Club Profiles

Association of Clandestine Enthusiasts (A*C*E)

The focus of A*C*E members is its monthly bulletin by the same name—*The Ace*. Pirate, clandestine, covert, numbers and other unexplained or unlicensed broadcasts, and the motives behind them are the topics of discussion. ACE as an organization does not encourage, support or condone any illegal activity, but seeks to further the enjoyment of the listening hobby.

If you like what George Zeller writes and you want more thorough treatment and loggings, send \$2 to A*C*E for a sample issue. Annual dues are \$18 in the US, \$19 in Canada and \$25 elsewhere; A*C*E, P.O. Box 11201, Shawnee Mission, KS 66207.

Northeast Ohio DXers

The Northeast Ohio DXers, founded in 1990, is an informal club created to foster interaction between DXers in the Cleveland-Akron-Lorain metro area. Their meetings usually involve informal discussions, displays of equipment, and presentations on DX hobby topics. An annual picnic is held during the summer. Future plans

include a DXpedition.

Meetings are open, and anybody who is in Cleveland on the third Tuesday of the month is very welcome to attend. Meetings are at 7 p.m. at the Brecksville Public Library, 9089 Brecksville Road (Route 82 at Route 21). For more information call Mike Fanderys at 216-661-2443, or write 2802 North Avenue, Parma, OH 44134.

Club Listings N-Z

Don't see your club listed this month or in last month's A-M listing? Write or call the Brasstown office to request a form for the Club Circuit.

National Radio Club: Paul Swearingen, Publisher, P.O. Box 5711, Topeka, KS 66605-0711. Worldwide; AM/FM. *DX News* 30 times yearly, sample for a 29 cent stamp.

NYC Radio Fre(ak)Qs: Joe Alverson, 199 Barnard Ave., Staten Island, NY 10307, 718-317-5556. NY boros & LI; VHF/UHF/HF utilities.

North American SW Assoc.: Bob Brown, Executive Dir., 45 Wildflower Lane, Levittown, PA 19057. Worldwide; Shortwave broadcast only. *The Journal*.

Northeast Ohio SWL/DXers: Mike Fanderys, 5618 Velma Ave., Parma, OH 44129, (216) 661-2443. NE Ohio; SWBC and utilities.

Northeast Scanner Club: Les Mattson, P.O. Box 62, Gibbstown, NJ 08027, (609) 423-1603 evenings. Maine thru Virginia; UHF/VHF, public safety, aircraft, military. *Northeast Scanning News (NESN)*.

Ontario DX Association: Harold Sellers, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada, (416) 853-3169 voice & fax, (416) 299-6392 DX-Change information svce. Predominantly Providence of Ontario; SWBC, utility, MW, FM-TV, scanning, technical, propagation. *DX Ontario*.

Pacific NW/BC DX Club: Phil Bytheway, 9705 Mary NW, Seattle, WA 98117, (206) 356-3927. WA, OR, ID, BC; DXing all bands.

Pakistan SW Listeners Club: Mrs. Fatima Naseem, Sultanpura, Sheikhpura, 39350 Pakistan; Pakistan; SWBC.

Pitt City SW Listeners Club: L. Neal Sumrell, Rt. 1 Box 276, Sumrell Rd., Ayden, NC 28513-9715. Eastern NC; Shortwave bands. *The DX Listeners*.

Puna DX Club: Jerry Witham, P.O. Box 596, Keaau, HI 96749; Puna, HI; SW and MW.

Radio Monitors of Maryland: Ron Bruckman, P.O. Box 394, Hampstead, MD 21074. Maryland; VHF/UHF/HF utilities. *Radio Monitors Newsletter of MD*.

RCMA (Radio Communications Monitoring Assn.): Carol Ruth, Gen'l Mgr., P.O. Box 542, Silverado, CA 92676. North America, Europe, Australia; All modes above 30 MHz. *RCMA Journal*.

Regional Communications Network (RCN): Bill Morris, Public Info. Officer, Box 83-M, Carlstadt, NJ 07072-0083. 50 mile radius of NY City; 2-way Radio Public safety notification group.

Rocky Mountain Radio Listeners: Wayne Heinen, 4131 S. Andes Way, Aurora, CO 80013-3831. Colorado Front Range; All bands. Annual meeting calendar for an SASE.

Southern California Area DXers (S.C.A.D.S.): Don R. Schmidt, 3809 Rose Ave., Long Beach, CA 90807-4334, (310) 424-4634. California area; AM, FM, TV, scanner and shortwave broadcasting.

SPEEDX (Society to Preserve the Engrossing Enjoyment of DXing): Bob Thunberg, Business Mgr., P.O. Box 196, DuBois, PA 15801-0196. Worldwide; SWBC, utilities. *SPEEDX* monthly newsletter.

Susquehanna City Scanner Club: Alan D. Grick, P.O. Box 23, Prospect St., Montrose, PA 18801. PA area; Scanning all bands.

Toledo Area Radio Enthusiasts: Ernie Dellinger, N8PFA, 6629 Sue Lane, Maumee, OH 43537, (419) 865-4284. NW Ohio and SE Michigan; Shortwave, scanning, amateur.

New Additions:

Southern Cross DX Club Inc.: G.P.O. Box 1487, Adelaide, SA 5001, Australia. Australia, New Zealand, South Pacific; All bands. *DX Post*.

Let's Start a Club:

Rocky Mountain Monitoring Enthusiasts: Interested in forming a statewide scanner monitoring group? Possible activities: group outings and tours, frequency exchange, statewide monthly newsletter. Send your address, phone number and ideas to: James L. Richardson (CT-051) 11391 Main Range Trail, Littleton, CO 80127-4049 or a message at 1-303-933-2195.

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Aug 1-2	Jacksonville, FL	Jacksonville Amateur Radio & Computer Show/Greater Jacksonville ARC P.O. Box 11882, Jacksonville, FL 32239. Location: Prime Osborn Convention Center. Friday 1-8PM, Saturday 9AM-5PM, Sunday 9AM-3PM. \$5 admission.
Aug 8	Huntington, WV	Tri-State ARC Hamfest/Bill, KF8QK, 304-522-1933 Location: Huntington Civic Center, 8:00AM
Aug 9	Frankfort, KY	Central Kentucky ARRL Hamfest/Bobby Rolph, KB4QNR 2117 Winterberry Road, Lexington, KY 40504 (606) 278-7570 evenings. Location: Western Hills HS, Exit 53 off I-61. \$6 admission.
Aug 9	Mineral Wells, WV	Mid-Ohio Valley ARC Hamfest/Ron Ferrell, WD8RGZ, 614-423-5482 Location: 4-H Campgrounds, 2 miles off I-77 on Rt 14, daylight to 3PM. Talk-in on 146.745 and 443.05.
Aug 9	Warrington, PA	Mid-Atlantic ARC Hamfest/Al Maslin, W3DZI, (215) 446-4936. Location: Bucks County Drive-In on US 611; 8 AM; \$4 admission. Talk-in on 147.66/147.06 and 146.52.
Aug 14-16	Park City, UT	WIMU '92/CO Association of DXers*
Aug 15-16	Albuquerque, NM	Duke City Hamfest/Jay Miller, WA5WHN PO Box 6552, Albuquerque, NM 87197. Location: National Guard Armory, 600 Wyoming NE, starts 9AM, free admission.
Aug 15-16	Huntsville, AL	Alabama State Convention/Don Tunstill, WB4HOK 1215 Dale Dr., Huntsville, AL 35801
Aug 20-23	Los Angeles, CA	ARRL National Convention/Sandy Heyn, WA6WZN 962 Cheyenne St., Costa Mesa, CA 92626
Aug 21-24	Tampere, Finland	European DX Council Conference Details: Finnish DX Association, PO Box 454, SF-00101 Helsinki, Finland.
Aug 23	Cincinnati, OH	Great Cincinnati ARA/John Haungs, WA8STX 10615 Thornview Dr., Cincinnati, OH 45241
Sept 6	Burlington, IA	Burlington Hamfest/Chuck Gysi, N2DUP, PO Box 974, Burlington, IA 52601-0974, (319) 752-3000. Location: Iowa National Guard Armory, Summer Street Road. 7:30 AM to 3:00 PM, \$4 admission. Talk-in on 146.790/146.520.
Sept 12-13	Melbourne, FL	Melbourne Hamfest/Gerry Wentz, KC4EHT, (407) 254-3095. Location: Melbourne Auditorium, talk-in on 146.85.
Sept 19-20	Peoria, IL	Peoria ARC Superfest/Merv Rennich, N9FXS PO Box 3508, Peoria, IL 61612-3508. Location: Exposition Gardens, Northmoor and University. Gates open at 6:00 AM, \$5 admission, talk-in on 146.76/16.
Sept 19-20	VA Beach, VA	VA Beach Hamfest/Lewis B. Steingold, W4BLO 3449 Dickens Drive, Va Beach, VA 23452, (804) 486-3800. Location: VA Beach Pavilion.
Sept 20	Mt. Clemens, MI	L'Anse Creuse ARC Swap Shop/Jerry & Donna Luh, KA8QBC & KA8QBD 732 Brookwood Lane, Rochester Hills, MI 48309, (517) 595-2309. Location: L'Anse Creuse HS; \$3 admission. Talk-in on 147.08/68 or 146.52.
Sept 26-27	Louisville, KY	Great Lakes Division Convention/Mike Doerhoefer, WB4AJZ PO Box 34233, Louisville, KY 40232.
Sept 27	New Pt Richey, FL	Pasco County Hamfest/Ralph, N4QIK, (813) 847-4043 Location: New Port Richey Rec Center, 6630 Van Buren. 9:00 AM to 5:00 PM, \$5 admission, talk-in on 145.35 or 147.15.
Sept 27	Yonkers, NY	Metro 70 cm Network/Otto Supliski, WB2SLQ 53 Hayward St., Yonkers, NY 10704.
Sept 27	Longmont, CO	BARCfest/CO Assoc of DXers* Location: Boulder County Fairgrounds

*SASE to Colorado Association of DXers, P.O. Box 22202, Denver, CO 80222-0202 for information.

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to:

Monitoring Times Special Event Calendar
P.O. Box 98
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ICOM R1 like new \$400, purchased 2/29/92 with accessories. (714) 687-6781.

AR1000: 1000 channel handheld scanner covers 8-600, 805-1300 MHz complete, exc. cond., inc. book by Harold Bornstein, "Guide to the AR1000." \$325. Bearcat 300 complete exc. cond. \$100. Ruby (708) 358-1150.

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VETRASONIC sound detector wanted; also transmitter operator's manual. Walter, Route 2, Elkland, MO 65644.

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Eric has also recently upgraded to the Kenwood R5000, and found it took time to master all the intricacies. When he heard that someone mentioned on the Monitor's "Letterbox" program that they were having trouble operating the R5000, he spent six hours typing up a "Step by Step Approach."

"Should anyone be experiencing difficulty in operation of the Kenwood, I would be pleased to assist them with my 'Step by Step Approach' in plain and simple language. If they want it, send a stamped addressed envelope or two IRC's to Eric Walton, P.O. Box 346 Station A, Vancouver, British Columbia, Canada V6C 2M7."

Running Interference?

Take a look at the picturesque postcard of Vancouver on page 4 sent by Eric Walton. Now picture a gigantic floating city cruising into the Sound. Shore leave for five thousand sailors from the visiting U.S.S. *Ranger* is usually good business. However, a reader from Vancouver sent us a video tape of two newscasts by British Columbia Television reporting on devastating signal interference experienced by the radio dispatch for BC Ambulance Service. It began gradually during the day June 4th, until finally, calls to the ambulance service had to be made by landline, and ambulances had to report back to the dispatch center after each trip for their next assignment.

Although the source of the interference was unknown, the USS *Ranger* seemed the most likely culprit. The frequency used for on-board communications according to the report was that

of the ambulance service. Our anonymous contributor says 138-144 MHz is allocated to public safety. The ambulance service "has several repeaters operating 138 MHz input and 142 MHz output as well as several simplex frequencies in the 149 range." The USN frequency is not known.

On June 5th, the newscast reported that half an hour after the previous day's report was aired, the interference disappeared and did not return. The *Ranger* denied any responsibility and the newscaster admitted, "we may never know."

A couple of corrections need to be mentioned; the picture of the microwave tower that was toppled by vandals (July issue, "Letters") was in Itasca, Illinois, not New York. My apologies to Jack Svetlik for the slip. Also, Peter James of Portland, Maine, says, "I hope Kevin Carey is not using the map of Canada (March 1992, p.52) for anything like navigation in the Atlantic Provinces... The island of Newfoundland is indicated as being Prince Edward Island." Actually, the scale of the map is too small to show Prince Edward Island. Sorry, about those slip-ups, gentlemen, and thanks for your corrections.

I hope you enjoy our introductory article on weather facsimile this month. Ken Reitz, in his June column, had recommended an article on facsimile published in the May issue of *Earth* magazine. Reader William Day called the publisher but was informed that issue was completely out of stock. However, William says that for \$5 you can get a reprint. Ask for: "Receive Satellite Images on Your Computer" May 1992, *Earth* magazine, 21077 Crossroads Circle, Waukesha, WI 53187; 414-796-8776.

If your local weather is getting you down, get a different perspective—try the world view and get above it all by satellite. Don't let summer dog days ruin your good monitoring times!

Rachel Baughn,
Editor

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Personal Pet Peaves

Over the years, one can't help building a retinue of annoyances; you might wish to share your own. Here are a few of mine:

Publications that snipe at each other. If you're really as good as you think you are, your readers will figure that out on their own. They can also figure out that such juvenile potshots are a sign of insecurity.

Expensive products that are made to be thrown away rather than repaired. We recently needed to buy a \$1.50 microswitch for a \$40 soldering iron. The manufacturer didn't have such an item; we had to replace the whole thing.

Vendors who advertise super-low prices, but don't really have merchandise. These unscrupulous con artists wait until they have enough back orders to get the maximum factory discount, all the while earning interest from the customers' cash.

Manufacturers who won't listen to consumers, but design and sell whatever they want because they dominate the marketplace. Such manipulation is becoming more and more prevalent with imported merchandise replacing domestic products.

Pre-recorded telephone switchboards. "If you know the extension of your party, press '1' now; if you don't know (etc.)..." My diseased mind creates scenarios like, "Hello, this is the Strike Command missile launch complex. If you know the exact location of your target, press '1' now; if you aren't sure about the location (etc.)..."

We can't cure all of the world's problems, but at least during these hot summer days of August we can feel some relief by blowing off a little steam!

Bob Grove
Publisher





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